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National Energy Board Report

Enbridge Pipelines Inc.

OH-002-2015

Volume II: Our Detailed Assessment

April 2016

Facilities

Canada

National Energy Board

National Energy Board Report

In the Matter of

Enbridge Pipelines Inc.

Application dated 5 November 2014 for the Line 3 Replacement Program

OH-002-2015

Volume II: Our Detailed Assessment

April 2016

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Glossary of Terms, Abbreviations and Units

Applicant, Enbridge or the Company	Enbridge Pipelines Inc.
Application	Enbridge's application dated 5 November 2014, pursuant to sections 52 and 58 of the NEB Act and section 45.1 of the OPR.
ATP	Application to Participate
Board or NEB	National Energy Board
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CEARIS	Canadian Environmental Assessment Registry Internet Site
Certificate	Certificate of Public Convenience and Necessity as defined in section 2 of the NEB Act; Enbridge's Application included a request for a Certificate pursuant to section 52 of the NEB Act authorizing the construction and operation of the Section 52 Pipeline and related facilities.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CP	Cathodic Protection
CSA Z245.1	Canadian Standards Association Z245.1, Steel pipe
CSA Z662-15	Canadian Standards Association Z662-15, Oil and Gas Pipeline Systems
Decommissioned Line 3 Pipeline	The Existing Line 3 Pipeline after the Decommissioning Activities are carried out.
Decommissioning Activities	The treatment measures that will be applied to the Existing Line 3 Pipeline by Enbridge to decommission the Existing Line 3 Pipeline.
Decommissioned Period	The period of time from when the Existing Line 3 Pipeline has been decommissioned (that is, the treatments have been applied) until leave to abandon the Existing Line 3 Pipeline is granted by the Board pursuant to paragraph 74(1)(d) of the NEB Act.

Decommissioning Settlement Agreement	An agreement between The Canadian Association of Energy and Pipeline Landowners Associations (CAEPLA), Manitoba Pipeline Landowners Association (MPLA), Saskatchewan Association of Pipeline Landowners (SAPL) and Enbridge to settle all issues raised by CAEPLA, MPLA, and SAPL in respect of the decommissioning of the Existing Line 3 Pipeline.
Designated Project	A defined term in subsection 2(1) of CEAA 2012; this Project is a designated project pursuant to CEAA 2012 and its Regulations, and is therefore subject to a federal environmental assessment under CEAA 2012.
DFO	Department of Fisheries and Oceans
EA	Environmental Assessment
EAE	Enhanced Aboriginal Engagement
ECCC	Environment and Climate Change Canada
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESA	Environmental and Socio-Economic Assessment
Existing Line 3 Pipeline	The portion of the existing Line 3 pipeline, forming part of the Project, for which Enbridge requests an Order pursuant to section 45.1 of the OPR.
FWT	Fluid Withdrawal Test: The method recognized by the American Petroleum Institute for directly testing a leak detection system by removal of fluid from the pipeline.
Governor in Council	The Governor General acting on the advice of the Federal Cabinet
HDD	Horizontal Directional Drill
ILI	In-line Inspection

Intervenor	A person, company or group who applied to participate in the hearing and was granted standing by the Board to participate as an Intervenor; has rights and obligations in the proceeding as set out in the Hearing Order.
IR or Information Request	A written question to the Applicant or an Intervenor in relation to its evidence filed by the Board, an Intervenor or the Applicant during the written portion of the hearing pursuant to the deadlines set out by the Board, to which a response must be subsequently filed.
LSA	Local Study Area
Line 3 Replacement Pipeline	The pipeline and facilities, forming part of the Project, for which Enbridge requests a Certificate pursuant to section 52 of the NEB Act and an Order pursuant to section 58 of the NEB Act.
MOP	Maximum Operating Pressure
NEB	National Energy Board
NEB Act	*National Energy Board Act*
O.D.	Outside Diameter
OPR	*National Energy Board Onshore Pipeline Regulations*
PFP	Participant Funding Program
Participant	A person, company or group who has applied to participate in the hearing and who was granted standing to participate by the Board. The term participant includes Intervenors and Commenters in the hearing.
Process Advisor	Board staff assigned to provide assistance to the public, landowners, Aboriginal groups, and Participants to help them understand the process, the different roles of the hearing participants, and how to participate in the hearing.
Project	The Line 3 Replacement Program, and all of its applied-for components.
RSA	Regional Study Area

Report or National Energy Board Report	Report submitted by the Board to the Minister (as defined in section 2 of the NEB Act) that sets out the Board's recommendation as to whether a Certificate should be issued for all or any portion of the pipeline, the reasons for the recommendation, and all the terms and conditions the Board considers necessary or desirable in the public interest to which any Certificate would be subject, pursuant to section 52 of the NEB Act. This Report also contains the Board's decisions in respect of Enbridge's applications under section 58 of the NEB Act and section 45.1 of the OPR.
RoW	Right-of-Way
RSV	Remote Sectionalizing Valves, also referred to as mainline valves in this Report
SARA	*Species at Risk Act*
SCADA	Supervisory Control and Data Acquisition
SKP	Station Kilometre Post
Section 52 Pipeline and related Facilities	The proposed pipeline and related facilities, forming part of the Project, for which Enbridge requests a Certificate pursuant to section 52 of the NEB Act. Specifically, the Section 52 Pipeline and related Facilities are two new 914 mm O.D. (NPS 36) replacement pipeline segments with a total Pipeline length of approximately 1,096 km. The proposed pipeline would transport heavy, medium and light crude oil at an MOP of 9,930 kPa.
Section 58 Facilities	The proposed facilities, forming part of the Project, for which Enbridge requests an Order pursuant to section 58 of the NEB Act. The Section 58 Facilities include 18 new pump stations, nine sending and receiving trap facilities, and expansion work at the Hardisty Terminal in Alberta encompassing three new storage tanks (50,000 m^3) with associated facilities.
Sensitivity	The size of leak that a leak detection system is capable of detecting, and the time required to detect a leak of that size.
TEK	Traditional Ecological Knowledge
TLRU	Traditional Land and Resource Use
TLU	Traditional Land Use
TWS	Temporary Workspace

List of Units

Bbl/d	Barrels per day
ft	feet
km	Kilometre
Kb/d	Thousands barrels per day
kPa	Kilopascal (one thousand pascals)
L	Litre
m	Metre
m^3/d	Cubic metres per day
mg/L	Milligrams per litre
mm	Millimetre
MPa	Megapascal (one million pascals)
%	Per cent

Recital and Appearances

IN THE MATTER OF the *National Energy Board Act*, R.S.C. 1985, C.N-7 as amended and the regulations made thereunder; and the *Canadian Environmental Assessment Act, 2012*;

IN THE MATTER OF an application dated 5 November 2014 by Enbridge Pipelines Inc. for the Line 3 Replacement Program, pursuant to sections 52 and 58 of the *National Energy Board Act* and section 45.1 of the *National Energy Board Onshore Pipeline Regulations*, filed with the National Energy Board under File No. OF-Fac-Oil-E101-2014-11 02; and

IN THE MATTER OF National Energy Board Hearing Order OH-002-2015 dated 4 May 2015;

HEARD in Winnipeg, Manitoba on 30 November to 3 December 2015; and in Calgary, Alberta on 7 December to 10 December 2015 and 14 December 2015;

BEFORE:

J. Ballem	Presiding Member
C. P. Watson	Member
M. Richmond	Member

Oral Traditional Evidence

Assembly of Manitoba Chiefs	Grand Chief Derek Nepinak Elder Dave Courchene Jr. Elder Mary Maytwayashing Elder Florence Paynter Elder D'Arcy Linklater Elder Henry Skywater Elder Harry Bone
File Hills Qu'Appelle Tribal Council	Chief Clarence Bellegarde Mr. Rick Favel Elder Hartland Goodtrack Elder John Stonechild Mr. Noel Starblanket Mr. Todd Cappo Mr. Harold Lavallee
George Gordon First Nation	Chief Shawn Longman Elder Mike McNab Councillor Hugh Pratt Mr. Scott Barnes Mr. Solomon Cyr

Keeseekoose First Nation	Councillor Kevin Musqua Ms. Cheryl Quewezance
Manitoba Metis Federation	Mr. William Goodon Mr. Douglas Pople Mr. Al Benoit Ms. Jasmine Langhan
Michel First Nation	Chief Gil Goerz Councillor Roy Goerz Ms. Jessie Loyer Ms. Tracy Campbell
Moosomin First Nation	Chief Bradley Swiftwolfe Mr. Kim Lonsdale
Ochapowace Nation	Chief Margaret Bear Elder Ross Allary Elder Charles Pratt Ms. Shelley Bear Mr. Dennis Bear
Pasqua First Nation	Chief M. Todd Peigan Councillor Beverly Chicoose Councillor Kevin Missens Councillor Don Strongeagle
Peguis First Nation	Chief Cindy Spence Councillor Wade Sutherland Mr. Lloyd Stevenson Elder Faylene Sutherland Elder Floyd Sutherland Mr. Vincent Orvis Mr. Jared Whelan Mr. Mike Sutherland Ms. Lana Sutherland Mr. Cheyenne Parisian-Mir Ms. Gaile Whelan-Enns
Piikani First Nation	Mr. Dustin Wolfe Elder Wilfred Yellow Wing Elder Patrick Provost Elder Shirley Crow Shoe

Roseau River Anishinabe First Nation	Chief Alfred Hayden Grand Chief Terrance Nelson Councillor Robert Henry Councillor Zongidaya Nelson Councillor Cecil James
Samson Cree Nation	Mr. Henry Lighting Mr. Bruce Cutknife Elder Kenneth Saddleback Ms. Norine Saddleback Mr. Kyra Northwest Elder Leo B[illegible]no
Southern Chief's Organization	Grand Chief Terrance Nelson Chief Kenneth Chalmers

Oral Final Argument

Appearances	**Participants**
Mr. Don Davies, QC Mr. Robert Bourne	Enbridge Pipelines Inc.
Ms. Allison Fenske Ms. Joëlle Pastora Sala	Assembly of Manitoba Chiefs
Mr. Stewart Crone	Mr. Stewart Crone
Mr. Scott Barnes	George Gordon First Nation
Ms. Tracy Campbell	Michel First Nation
Chief M. Todd Peigan	Pasqua First Nation
Mr. Jesse McCormick	Peguis First Nation
Mr. Jeff Howe	White Bear First Nations
Ms. Diana Audino Ms. Katherine Murphy	National Energy Board

Written Final Argument

Enbridge Pipelines Inc.
Government of Alberta
Assembly of Manitoba Chiefs
George Gordon First Nation
Keeseekoose First Nation
Manitoba Government
Mosquito-Grizzly Bear's Head-Lean Man First Nation
Ochapowace Nation
Progressive Contractors Association of Canada
Peguis First Nation
Samson Cree Nation
Stoney Tribal Administration
The Manitoba Metis Federation

Chapter 1

Purpose and Overview

1.1 The Application and Description of Project

On 5 November 2014, Enbridge filed an application (Application) with the Board seeking approval for the Line 3 Replacement Program (Project). The Project includes decommissioning of approximately 1,067 km of existing, aging pipeline (Existing Line 3 Pipeline) and replacing it with approximately 1,096 km of new pipeline constructed to modern standards (Line 3 Replacement Pipeline). The Project is divided into two segments. The first segment extends from the Hardisty Terminal in Alberta to the Cromer Terminal in Manitoba. The second segment extends from tie-in point NW 9-9-26 WPM to the Gretna Station in Manitoba. Enbridge indicated that the Project will allow for the continued safe and reliable transport of crude oil and the flexibility to meet crude oil supply forecasts in North America. The Line 3 Replacement Pipeline will enable the transport of crude oil at throughput levels similar to those the Existing Line 3 Pipeline was once capable of shipping prior to the imposition of pressure restrictions by Enbridge. The Line 3 Replacement Pipeline will operate at the Existing Line 3 Pipeline's original design average annual capacity of 127 190 m^3/d (760,000 bbl/d).

In its Application, Enbridge requested the following from the Board:

- A recommendation in its report to the Minister pursuant to section 52 of the *National Energy Board Act* (NEB Act or Act), that a certificate of public convenience and necessity be issued for the Project;
- A recommendation in its report with respect to the environmental assessment, serving as the Responsible authority pursuant to the *Canadian Environmental Assessment Act*, as amended (CEAA 2012), that after taking into account the implementation of the mitigation measures specified in the report, the Project is not likely to cause significant adverse environmental effects;
- An order, pursuant to section 58 of the NEB Act, exempting the proposed new tanks, new pump stations and associated facilities from the provisions of paragraphs 30(1)(b), 31(c), 31(d) and sections 33 and 47 of the NEB Act and that the order take effect from the date the recommendation is made to the Governor in Council.
- An order, pursuant to section 45.1 of the *National Energy Board Onshore Pipeline Regulations* (OPR), allowing Enbridge to decommission the identified portions of the pipeline in accordance with the methodology set out in its Application; and
- Such further and other relief as Enbridge may request or the Board may deem appropriate pursuant to section 20 of the NEB Act.

On 4 February 2015, the Board determined that the Application was complete to proceed to assessment, and that it would issue its Report no later than 4 May 2016, subject to any modifications allowed under the NEB Act.

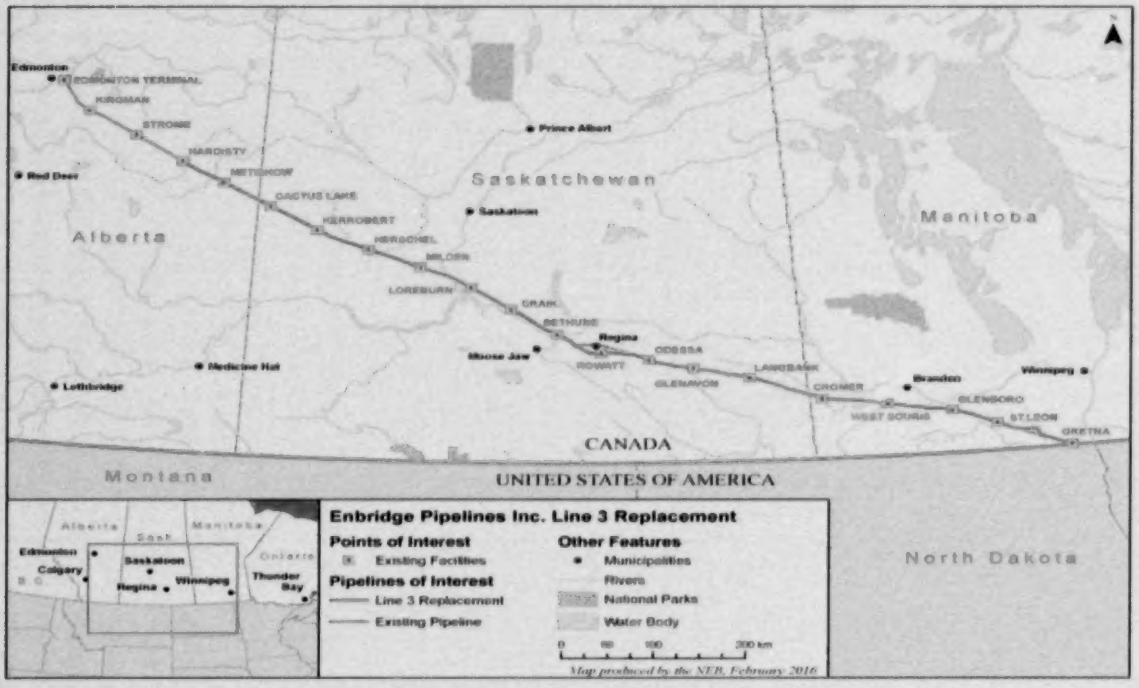
1.1.1 The Line 3 Replacement Pipeline

The Line 3 Replacement Pipeline will consist of two new segments of 914.4 mm O.D. (NPS 36) pipeline for a total length of approximately 1,096 km. It will also include:

- the installation of 55 new remotely operated sectionalizing valves (RSVs);
- the installation of 18 new pump stations and associated infrastructure and equipment;
- the construction of three new storage tanks located at the Hardisty Terminal; and
- associated interconnection work at facilities.

The right-of-way (RoW) for the Line 3 Replacement Pipeline will be alongside and contiguous to existing linear disturbances for approximately 88% of its length. The majority of the Line 3 Replacement Pipeline will be constructed within a construction RoW that parallels and overlaps existing Enbridge RoWs, including Enbridge's mainline corridor.

Figure 1-1 - Route Map for the Line 3 Replacement Pipeline



1.1.2 Decommissioning of the Existing Line 3 Pipeline

The decommissioning of the Existing Line 3 Pipeline will permanently remove from operation two segments of existing 863.6 mm O.D. (NPS 34) pipeline. Decommissioning of the Existing Line 3 Pipeline will occur once the Line 3 Replacement Pipeline is in operation. Chapter 4 of this Report provides additional details on the decommissioning of the Existing Line 3 Pipeline.

1.2 OH-002-2015 Hearing

1.2.1 NEB Hearing Order

On 5 February 2015, the Board issued a Notice of Hearing and Application to Participate convening a public hearing to assess the Project. The Board issued Hearing Order OH-002-2015 (Hearing Order) on 4 May 2015, which established the process for the public hearing. The Hearing Order included the List of Issues that the Board considered during its assessment of the Project. The Board amended the List of Issues on 29 May 2015. The List of Issues, as amended, is included in Appendix I of this Report.

On 28 August 2015, 30 October 2015 and 13 November 2015, the Board issued Procedural Updates 1, 2 and 3, respectively, related to the public hearing. Among other things, the Procedural Updates confirmed that the oral portion of the public hearing would commence on 30 November 2015 in Winnipeg, Manitoba and that the oral portion of the hearing would consist of oral traditional evidence and questioning related thereto, an opportunity for Enbridge to present a Reply Panel in response to oral traditional evidence, and oral final argument.

1.2.2 Hearing Participation

Pursuant to section 55.2 of the NEB Act, the Board must determine who may participate in a hearing for a project before the Board. To be eligible to participate, interested persons or groups must request participation and demonstrate in their participation application to the Board that:

- they are directly affected by the proposed project; or
- they have relevant information or expertise that will assist the Board in making its decisions and recommendation in respect of a proposed project.

Those who wished to participate in the hearing process for the Project were required to submit Applications to Participate (ATPs) to the Board by 31 March 2015. The Board received and reviewed 81 ATPs for the Project: 39 were granted Intervenor status and 26 were granted Commenter status.

The Board denied standing to 16 applicants who had applied for either Intervenor or Commenter participation status. Of these, several ATP applicants inadvertently applied to participate in this hearing when they intended to apply to participate in another hearing before the Board.

Between 1 April and 2 November 2015, the Board received and granted standing to all those who applied to participate after the deadline (those were, 14 ATPs).

Certain Intervenors also advised the Board that they wanted to withdraw from participating in the hearing: Agriculture and Agri-Food Canada, the Canadian Association of Energy and Pipeline Landowner Associations, the Manitoba Pipeline Landowners Association and the Saskatchewan Association of Pipeline Landowners (CAEPLA/MPLA/SAPL), and Ocean Man First Nation (Ocean Man). The Board accepted all Intervenor withdrawal requests and granted CAEPLA/MPLA/SAPL's request to continue to participate in the hearing as a Commenter.

The Board received and granted requests for a one week extension to file Information Requests to Enbridge from Roseau River Anishinabe First Nation (Roseau River), Southern Chiefs' Organization (SCO), Canupawakpa Dakota Nation (Canupawakpa) and Dakota Tipi First Nation (Dakota Tipi).

The Board received 13 requests for extensions to file Intervenor written evidence. In deciding whether to grant these requests, the Board considered the reasonableness of the requests and whether the requested extensions would prejudice any parties. The Board also took into account subsection 11(4) of the NEB Act, which requires it to hear all applications as expeditiously as the circumstances and considerations of fairness permit, but within the time limit mandated by section 52 of the NEB Act.

The Board granted all requested extensions to the Intervenor written evidence deadline to 30 September 2015: a two month extension. The Board denied certain requested extensions to the Intervenor written evidence deadline that extended beyond 30 September 2015, indicating that the longer extensions may cause undue prejudice and would materially impact the hearing schedule. The Board allowed Piikani First Nation (Piikani), Dakota Tipi and Samson Cree Nation (Samson) to file any Traditional Knowledge and Traditional Use studies by 23 November 2015.

On 30 September 2015 and 16 November 2015, the Board received invitations from the Assembly of Manitoba Chiefs (AMC) to attend a Gathering at Turtle Lodge that was held on 28 November 2015 (Gathering). The AMC indicated that the Gathering would be a day of sacred ceremony, feasting and sharing a Statement in Alliance with Nature and Mother Earth Mide Aki (Statement).

In a response dated 19 November 2015, the Board indicated it would not be appropriate for the Board Panel considering the Project to attend, because of its quasi-judicial role. However, the Board decided to send two Board Members, who were not Members of the Panel considering the Project, to attend the Gathering along with Board staff. The Board indicated that it recognized the importance of the Gathering and was very interested in attending, such that it could learn and gain a better understanding of issues of importance to the AMC. The Board further indicated that, while the Statement made at Turtle Lodge would not form part of the hearing record for the Project, the Board would use the information shared to support continual improvement in its regulation of pipelines.

1.2.3 Written Hearing Process

The OH-002-2015 hearing consisted of both written and oral portions. The written portion of the hearing included the following[1]:

- Enbridge's Application, additional/supplemental and reply evidence;
- Intervenors' written evidence;
- Commenters' letters of comment;
- Board information requests (IRs) to Enbridge and Intervenors, and the corresponding responses;
- Enbridge's and Intervenors' IRs to each other, and the corresponding responses;
- Notices of Motion and responses; and
- Written final argument.

1.2.4 Oral Hearing Process

The oral portion of the hearing was held in Winnipeg, Manitoba from 30 November to 3 December 2015 and from 7-10 and 14 December 2015 in Calgary, Alberta.

The Board heard oral traditional evidence from the following Aboriginal groups:

- Assembly of Manitoba Chiefs
- Ochapowace Nation
- The Manitoba Metis Federation
- Moosomin First Nation
- Southern Chiefs' Organization
- Roseau River Anishinabe First Nation
- Keeseekoose First Nation
- Pequis First Nation
- Michel First Nation
- Pasqua First Nation
- Samson Cree Nation
- George Gordon First Nation
- File Hills Qu'Appelle Tribal Council
- Piikani First Nation

[1] This is not an exhaustive list. These steps are not listed in chronological order.

In addition to Enbridge providing oral final and reply argument, the Board also heard oral final argument from the following Intervenors:

- Assembly of Manitoba Chiefs
- Mr. Stewart Crone
- George Gordon First Nation
- Michel First Nation
- Pasqua First Nation
- Peguis First Nation
- White Bear First Nations

The evidentiary portion of the OH-002-2015 hearing was closed on 10 December 2015. Written final argument was filed on 11 December 2015 and oral final argument was completed on 14 December 2015, when the hearing record was closed.

1.2.5 Participant Funding

The Board administers a Participant Funding Program (PFP) that provides some financial assistance to support participation of individuals, Aboriginal groups, landowners, incorporated non-industry not-for-profit organizations, or other interested groups in the Board's hearing process.

The Board established a Funding Review Committee to review applications for participant funding. This committee is independent of both the Project proponent and the hearing process. On 29 October 2014, the Board established funding under its PFP to facilitate participation in the hearing process for the Project. The Board received 33 eligible applications (31 from Aboriginal groups and two from landowners) with a total funding request of $2.6 million.

Upon completion of a review of the applications by the Funding Review Committee, the Committee awarded funding totaling $999,000. More information on the PFP and the funding awards to all 33 eligible applicants can be found on the Board's web-site at http://www.neb-one.gc.ca/prtcptn/hrng/pfp/fndngrvwcmmttrprt-eng.html.

Life Cycle Approach

The Board regulates Canada's interprovincial and international pipelines, including Line 3, over their entire lifecycle: from design, through construction and operation, to decommissioning and eventual abandonment. The NEB's role does not end when a project is approved: the Board requires that people and the environment be protected throughout the entire pipeline lifecycle. The NEB imposes safety and environmental requirements on pipeline companies through a variety of means, including regulations and project-specific conditions.

The Board verifies a company's compliance with these requirements through activities including, as appropriate, company manual and report reviews, compliance meetings, inspections, audits, emergency response exercise evaluations, emergency procedures manual reviews, and incident investigations. When a non-compliance is identified, an immediate correction is required (when possible) by the company. If the situation cannot be corrected immediately, the Board uses a range of compliance and enforcement tools.

See Appendix VI for diagrams showing some of the conditions imposed by the Board on the Project.

Chapter 2

Economic Feasibility

2.1 Introduction

In making a recommendation on an application under section 52 of the NEB Act or a decision under section 58 of the NEB Act, the Board makes a determination regarding the economic feasibility of the project, after assessing the need for the proposed facility and the likelihood of it being used at a reasonable level over its economic life. To make this determination, the Board considers the supply of oil that will be available to be shipped on the pipeline, any transportation contracts underpinning a pipeline, and the availability of adequate markets to receive oil delivered by a pipeline.

The Board also considers other commercial impacts of the proposed facilities and the Applicant's ability to finance the construction and ongoing operation and maintenance of the proposed pipeline.

2.2 Need for Facilities

2.2.1 Oil Supply

Views of Enbridge

In its Application, Enbridge referenced the Board's June 2014 Canadian Energy Outlook (CEO) briefing note as well as statistics from the U.S. Energy Information Administration (EIA), to portray Canada's oil reserves as robust. Enbridge submitted that the 2014 CEO estimated Canadian oil and bitumen remaining established reserves to be 27.4 billion m^3 (171.3 billion bbl). Further, Enbridge added that, according to the EIA, Canada ranks third amongst the world in estimated remaining established reserves of oil and bitumen. Enbridge submitted that approximately 98% of these established reserves are located in Alberta's oil sands and, to date, approximately 95% of Alberta's oil sands have yet to be developed.

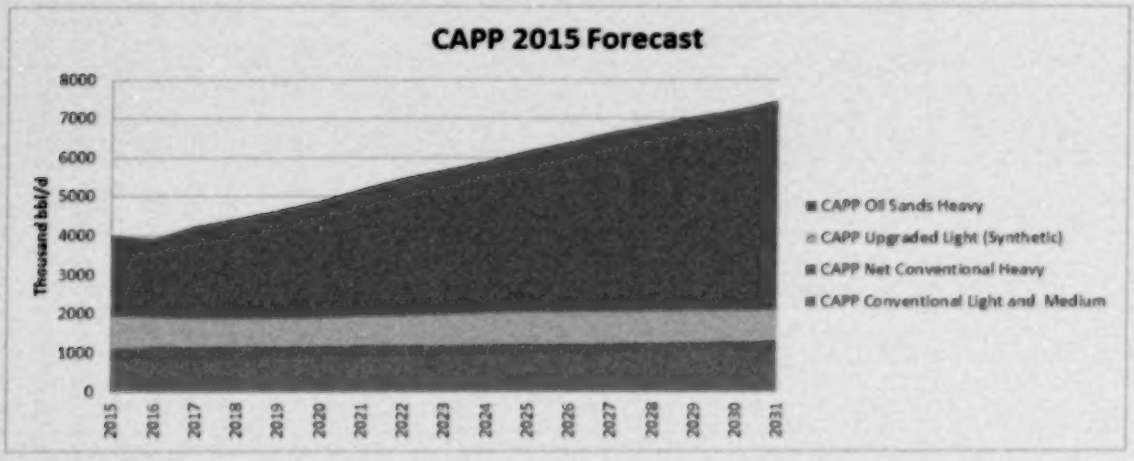
Regarding future crude oil supply, in its Application, Enbridge cited the 2014 CAPP *Crude Oil Forecast, Markets & Pipelines* report as well as the Alberta Energy Regulator (AER) ST98-2014 *Alberta's Energy Reserves 2013 and Supply/Demand Outlook 2014-2023* report. Enbridge was of the view that it was clear from both of these reports that long-term growth in Western Canadian oil supply can be expected, with the bulk of this growth coming from oil sands development. Specifically, the CAPP report forecasted that supply would reach 827 000 m^3/d (5.2 million bbl/d) by 2020 and 1 185 000 m^3/d (7.4 million bbl/d) by 2030.

In addition to the CAPP report, Enbridge submitted that the AER ST98-2014 report supports Western Canadian oil supply growth. To illustrate this, Enbridge highlighted the AER ST98-2014 report as forecasting 600 000 m^3/d (3.77 million bbl/d) of raw (unblended) bitumen production by 2023.

Revised Supply Forecast

In June 2015, after a period of sharply declining oil prices, the Board issued an IR to Enbridge seeking its views on the impact of the new pricing environment on crude oil supply in Western Canada. In response, Enbridge updated its Western Canadian oil supply forecast with the forecast from the 2015 CAPP *Crude Oil Forecast, Markets & Pipelines* report (Figure 2-1). Enbridge stated that this report indicates Western Canadian oil supply will approach approximately 783 000 m^3/d (4.9 million bbl/d) by 2020 and approximately 963 000 m^3/d (6.0 million bbl/d) by 2030. Further, the 2015 CAPP report expects that supply will grow annually by 23 000 m^3/d (145,000 bbl/d) over the forecast period of 2014 to 2030. Enbridge explained that CAPP expects that oil sands production, in the form of heavy crude oil blends and synthetic crude oil, will drive Canada's oil supply growth. Specifically, Enbridge noted that CAPP expects supply from oil sands to grow from 416 000 m^3/d (2.6 million bbl/d) in 2014 to approximately 799 000 m^3/d (5.02 million bbl/d) in 2030. The table below contains the revised supply forecast.

Figure 2-1 – CAPP 2015 Forecast



Views of Participants

Citing from three reports, Progressive Contractors Association (PCA) submitted that Canada's oil reserves could be as high as 315 billion barrels and discovered in-place bitumen resources as high as 1.8 trillion barrels. The result, PCA submitted, is many years of production at current yields. PCA stated that Canada has oil to export at a comparatively advantageous scale that exceeds most other nations in the world.

2.2.2 Markets

Views of Enbridge

Enbridge submitted the Project is needed and will be used and useful. Enbridge indicated the Project will enable it to meet demand in currently served markets in PADD II and Eastern Canada and will also accommodate incremental volumes of Western Canadian oil supply to new markets. Without the Project, Enbridge submitted, there will be insufficient pipeline capacity to transport current volumes of Western Canadian oil supply to downstream markets connected to the Enbridge mainline. Enbridge explained that, currently, the Existing Line 3 Pipeline is under a significant voluntary pressure restriction, which has reduced the capacity of the Existing Line 3 Pipeline to 62 000 m^3/d (390,000 bbl/d). The Line 3 Replacement Pipeline will restore average annual capacity to 127 190 m^3/d (760,000 bbl/d).

Enbridge submitted that any destination downstream from Edmonton can be considered a market to absorb the volumes shipped on the Line 3 Replacement Pipeline. Specifically, Enbridge listed that these destinations include: Saskatchewan; Upper Midwest/PADD II (Minnesota, Wisconsin, Chicago, Michigan/Ohio); Eastern Canada (Ontario); PADD I; and Mid-Continent markets (Cushing, OK/PADD III and Patoka, IL) via the Spearhead and Mustang pipelines. Enbridge added that the Line 3 Replacement Pipeline would also provide access to Quebec, the US Gulf Coast, and the lower mid-west PADD II market east of Patoka, through mainline extension projects such as Line 9, Flanagan South and the Southern Access Extension respectively.

To support its Application, Enbridge provided a report prepared by Muse Stancil (Muse). Enbridge stated the Muse report "provides an independent assessment of the Western Canadian crude oil market and the need to restore Line 3 [Existing Line 3 Pipeline] to its original operating capability". Enbridge submitted that the Muse report finds that there is sufficient demand for Western Canadian crude oil in the markets supplied by the Enbridge mainline such that it will be operating at or close to capacity for the forecast period.

Muse used its Crude Optimization Model (Muse Model) to quantify the expected throughput on the Enbridge mainline using a reasonable scenario of Canadian crude oil supply. More specifically, Muse described its Model in its report as a mathematical representation of the North American crude oil distribution system that predicts the flow of crude oil to various markets and that provides the resulting crude oil prices. Consequently, Muse submitted, its Model is well-suited for assessing the market implications of changes in Western Canadian crude oil delivery infrastructure.

In its Application, Enbridge submitted that the Muse Model assessed the demand for Canadian crude oil ex-Western Canada against the oil pipeline capacity ex-Western Canada. Specifically, Muse used CAPP's 2014 Western Canadian crude oil supply forecast as the supply input.

Revised Muse Analysis

In response to a Board IR seeking clarification on the potential impact of lower oil prices on crude oil supply and pipeline throughputs, Enbridge requested that Muse update its supply input, using CAPP's 2015 Western Canadian crude oil supply forecast. Muse indicated in its report that the transportation infrastructure used in the Muse Model included the existing North American crude oil pipeline network, plus all significant pipeline projects that Muse determined to be reasonably expected. Muse submitted that these expected projects include TransCanada's Keystone XL pipeline, Enbridge's Northern Gateway pipeline, and TransCanada's Energy East

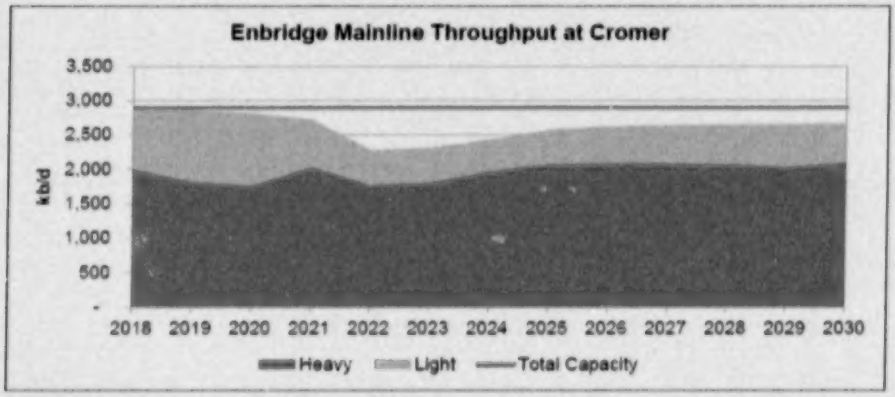
pipeline. In response to an IR, Enbridge also deferred the expected start dates of these pipelines by two years. Muse confirmed that it did not include the Trans Mountain Expansion Project in its analysis and clarified that it was not expressing a professional opinion in its report as to which pipeline projects would be built, but assumed only one West Coast pipeline would be built over the forecast period.

Muse submitted that the Muse Model includes detail on individual North American refineries in order to analyze North American crude oil markets. Muse indicated that there are five regional submarkets accessible to Canadian crude via the Enbridge mainline: the Upper Midwest, the Lower Midwest, Ontario/Quebec, the Midcontinent, and the Gulf Coast. Muse further submitted that the Upper Midwest and Ontario/Quebec submarkets are primarily accessible from Western Canada via the Enbridge mainline. The Lower Midwest, Midcontinent, and Gulf Coast submarkets can be accessed by both the Enbridge mainline and the TransCanada Keystone pipeline. Finally, the Midcontinent and Gulf Coast can be accessed from the Enbridge mainline via the Flanagan South and the Spearhead pipeline.

In conclusion, Muse submitted that its analysis showed that there is sufficient demand for Western Canadian crude oil in the markets supplied by the Enbridge mainline, such that the Enbridge mainline will be operating at or close to capacity for the forecast period.

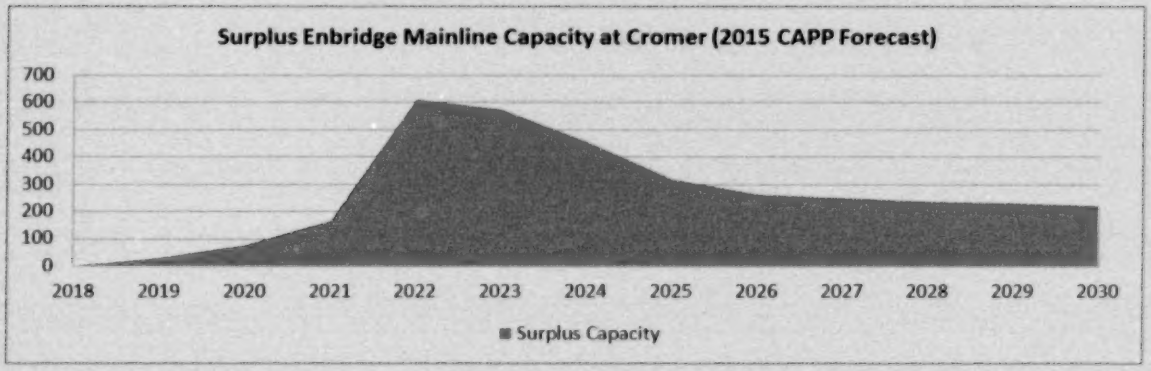
Figure 2-2 provides the projected Enbridge mainline throughput at Cromer of both light and heavy crude. "Total capacity" is the total effective Enbridge mainline capacity at Cromer throughout the forecast period, which the Muse report estimated at 2,891 kb/d or 95% of the total capacity of the individual Enbridge mainline pipelines (less refined product and natural gas liquids shipments).

Figure 2-2 – Enbridge Mainline Throughput at Cromer



Relative to total capacity, Muse determined that the incremental capacity created by the Project will be utilized in all years of the forecast period, except for 2022 through 2024. Figure 2-3 presents surplus capacity on the Enbridge mainline at Cromer. However, if one or more of the three pipeline projects were not built, Muse expected that the utilization of the Line 3 Replacement Pipeline would increase.

Figure 2-3 – Surplus Enbridge Mainline Capacity at Cromer



2.2.3 Ability to Finance

Views of Enbridge

Enbridge indicated that the total cost of the Project, including interest during construction, is estimated to be CAD $4.8273 billion. Enbridge submitted the Project will be owned by Enbridge Pipelines Inc., a wholly owned subsidiary of Enbridge Income Partners Limited Partnership, which is jointly owned by Enbridge Income Fund and Enbridge Inc. Enbridge submitted that Enbridge Pipelines Inc. will ultimately fund the Project using an existing credit facility, internally generated cash flows, term debt from the Canadian capital markets, as well as equity contributions from Enbridge Inc. and Enbridge Income Fund Holdings.

2.2.4 Economic Feasibility

Views of Enbridge

Enbridge submitted it considered two alternatives to the Project. Enbridge found the Project to be the most efficient way to maintain Line 3's reliability while reducing the frequency, magnitude and cost of ongoing integrity maintenance work. Enbridge indicated the first alternative was to continue to conduct ongoing integrity digs and repairs. However, Enbridge determined that relying solely on integrity digs and repairs would not adequately address the issues of operational reliability and underutilization and conducting frequent integrity digs is costly and intrusive to landowners along the Project.

The second alternative was to replace a number of segments on the Existing Line 3 Pipeline over the course of several years. Enbridge indicated a segmented approach to replacing the Existing Line 3 Pipeline would require multiple Board applications over several years. Further, segments not yet replaced would continue to require integrity digs and repairs, thus, the voluntary pressure restriction would not be fully lifted until all segments were replaced.

In contrast to these two alternatives, Enbridge found that the Project would be less intrusive to landowners and the environment, both over the short- and long-term. Further, the Project received support from shippers and the Canadian Association of Petroleum Producers; and, it would result in returning Line 3 to its original design flow-rate and address issues of operational reliability and underutilization.

Views of the Board

In the Board's view, the evidence demonstrates there is adequate supply to support the capacity of the Project. The Board is satisfied that there is sufficient market to absorb the volumes that will be delivered off the Line 3 Replacement Pipeline. The Board is satisfied that the Line 3 Replacement Pipeline will have access to numerous large downstream submarkets. The Board notes that no party contested Enbridge's evidence on crude oil supply or markets in this proceeding.

The Board is satisfied that the incremental capacity created by the Project will be substantially utilized throughout most of the forecasted period and that the Project would be relatively under-utilized for only a short time. The Board is of the view that the market determines which pipeline projects will provide competitive transportation service, facilitating the proper operation of the petroleum market. To obtain regulatory approval, a pipeline company must show that its facilities are expected to be used at a reasonable level. The Board notes, however, that there is uncertainty in projecting long-term use. These risks can include supply, market development and the evolution of transportation infrastructure overall.

Having considered the evidence, the Board finds the applied-for facilities are likely to be used at a reasonable level over the economic life of the Project.

The Board finds the proposed method of financing to be reasonable and accepts that Enbridge has the ability to finance the Project.

The Board does not have any concerns with the economic feasibility of the Project.

2.3 Financial Capacity

Views of Enbridge

Enbridge submitted that there is a low probability of an accident or malfunction causing permanent or long-term residual environmental effect of high magnitude that cannot be technically or economically mitigated. Enbridge stated that, "[a] product release could entail a relatively small leak or, in a severe instance, a failure with potentially substantial effects". Accordingly, Enbridge must have the financial capacity to manage such an event.

Potential Release Volume
Enbridge estimated the range of release volumes resulting from a full-bore pipeline rupture at maximum design capacity and with maximum drain down effect to be 7,623 bbls to 31,395 bbls. Enbridge assumed a 13 minute total duration of product release. Table 2-1 below provides the range of release volumes attributable to 10, 13, 20 and 40 minutes of product release.

Enbridge defined the initial release volume as the design flow rate multiplied by the total duration of the release, and the maximum release volume as the initial release volume plus any drain down resulting from gravity flow. Therefore, the initial release volume is the amount of escaped product from 13 minutes of operation at maximum design capacity, and the maximum release volume is this amount plus any product escape after valve closure.

Table 2-1 – Release Volumes

Time (min)	Initial Release Volume (bbl)	Maximum Release Volume (bbl)
10	5,864	29,636
13	7,623	31,395
20	11,728	35,500
40	23,457	47,229

Enbridge indicated that in the event of a release, 13 minutes is the maximum allowable time to shut down and close valves. Enbridge submitted that if the possibility of a leak cannot be ruled out within 10 minutes from detection of a release, the pipeline is shut down. The remote controlled sectionalizing valves in the relevant section are closed, which takes about 3 minutes.

Impact Categories /Consequence Components of an Escape

Enbridge indicated that it used an internally developed model to consider the potential costs and damages resulting from a full-bore pipeline rupture at maximum design capacity and with maximum drain down effect. The model consists of costs resulting from four impact categories: health and safety consequence; environment consequence; the business consequence to Enbridge and for businesses located in close proximity to the pipeline; and the consequences to Enbridge's reputation. Each category has a consequence model derived from Enbridge's historical costs and is a function of the calculated volume released and product type as well as receptors potentially impacted as a result of the release. Types of receptors include high consequence areas, such as: water bodies, populated areas, drinking water resources, environmentally sensitive areas, and commercially navigable waterways.

In its assessment of consequence, Enbridge acknowledged that it did not use a unit spill costs approach for the Line 3 Replacement Pipeline. Enbridge indicated that due to the site-specific variability, a unit cost approach, such as applying a dollars per barrel or dollar per hectare, was not appropriate. Enbridge was of the view that the costs of a release do not vary in a linear way with volume and determined the methodology applied was a more appropriate approach.

Estimate of Potential Costs and Damages

Using this model and the estimated release volumes of a full-bore pipeline rupture at maximum design capacity and with maximum drain down effect, Enbridge estimated that the potential costs and damages of a release would vary between a few million CAD and approximately $2 billion CAD within a range of high consequence areas. In the case of the $2 billion CAD estimate of costs and damages, Enbridge provided an apportionment on a % basis to the four impact categories as follows: Health and Safety, 1%; Environmental, 88%; Business, 2%; and, Reputation 9%. Enbridge noted that reputational costs would not be prioritized in relation to the other categories.

Financial Capacity to Fund the Costs of a Large Spill

Enbridge submitted that it has had proven access over several decades to Canadian capital markets. Enbridge indicated it continues to maintain strong investment grade credit ratings and strong relationships with a portfolio of over 20 separate banks from Canada, the United States and globally.

Enbridge submitted that its public debt is rated by Standard and Poor's Ratings Service (S&P) as BBB+ (Stable) and by Dominion Board Ratings Service (DBRS) as A (Developing).

Financial Instruments Available for Incident Response

Enbridge indicated that if an incident related to the Project were to occur, Enbridge would be able to satisfy its obligations, including third party claims, by drawing upon its substantial at-the-ready financial resources and those available after a brief mobilization period.

Enbridge clarified that at-the-ready financial resources consist of: unencumbered cash, commercial paper, and bank credit facility draws. Financial resources from North American capital markets for debt and equity would be available after a brief mobilization period of two weeks.

Enbridge indicated financial obligations will be met by at-the-ready financial resources in the following order: unencumbered cash, commercial paper, and then bank credit facilities. Further, Enbridge specified that unencumbered cash has same day availability while commercial paper and a drawdown at prime on its credit facilities require one day's notice. A drawdown on the London Interbank Offered Rate or Bankers' Acceptances would require three days' notice.

With regard to financial capacity, Enbridge submitted that it has committed bank credit facilities of $3 billion, including a $2 billion commercial paper program, and currently, approximately $1.5 billion of this committed bank credit facility is available. Further, Enbridge indicated that after a brief mobilization period, it could access the Canadian bond market for at least $1 billion. Enbridge specified it has been a frequent issuer in the Canadian debt capital markets; in 2013 Enbridge raised $550 million of bonds and on 24 September 2015 Enbridge issued $1 billion of bonds in Canadian debt markets.

Enbridge added that it may also draw upon cash from continuing operations as well as funds from affiliated companies. Enbridge explained that costs resulting from an incident are expected to occur over many months as remediation activities take place, which would allow it to use monthly free cash flow and potentially raise funds through the debt market multiple times.

Enbridge submitted that over the last nine months, it generated $605 million from continuing operations. Enbridge also indicated that Enbridge Income Fund, which indirectly owns Enbridge, has $1.5 billion of available committed bank credit facilities and Enbridge Inc., which has a 92% economic interest in Enbridge Income Fund, has approximately $3 billion of undrawn committed bank credit facilities.

Insurance

Enbridge indicated that insurance coverage cannot be considered a source of immediate funding, nor can it be described as being available after a brief mobilization period for the purposes of financial assurance. Rather, Enbridge indicated, insurance provides it with eventual recovery of monies paid due to legal liability for direct third-party bodily injury and property damage. Enbridge explained that it must first spend funds, then seek recovery of those funds from its insurers in the months and years following. Accordingly, Enbridge indicated that insurance policy limits do not define the limits of Enbridge's financial capability to address its potential responsibility.

Enbridge submitted that it will procure construction specific insurance during construction, and that the Project, once completed, will be included in the consolidated insurance program maintained by Enbridge Inc. for its affiliates (including Enbridge Pipelines Inc.). Enbridge submitted that the contemplated insurance policies, subject to policy terms and conditions, would provide coverage to all relevant facilities forming part of the Project and that insured entities would include Enbridge Inc., Enbridge Pipelines Inc., and affiliates as applicable. Enbridge further indicated that conditions and exclusions of the insurance coverage provided will be consistent with those considered standard in the industry. Enbridge indicated it reviews its insurance coverage for adequacy at least annually (based on potential operational risk exposures and insurance availability).

During the construction phase of the Project, Enbridge specified it will procure construction specific insurance, which would be in addition to Enbridge's consolidated insurance programs. Enbridge indicated the construction specific insurance it would contemplate would include Builder's All Risk/Course of Construction Insurance and Construction Wrap-Up Liability Insurance.

During the operational phase, Enbridge submitted that the Project will be included in Enbridge's consolidated insurance program. In the unlikely event that multiple insurable incidents exceed coverage limits within the same insurance period, coverage would be allocated equitably. In addition, Enbridge indicated that its consolidated insurance program includes, among other things:

- Property and Business Interruption Insurance Program – includes, among other things, the recovery of costs associated with physical loss or damage of key facilities and pipelines at major water crossings, subject to policy terms and conditions. The current coverage limit is CAD $800 million for any one event and is subject to aggregates for certain events such as earthquake or flood. The deductible is CAD $10 million per event and the program is renewed annually.
- General Liability Insurance – provides coverage for funds spent toward Enbridge's legal liability for third party property damage and injuries resulting from operational activities, including sudden accidental pollution events. The General Liability Insurance program, which is reviewed annually, has an annual total limit of USD $860 million with USD $30 million deductible for sudden and accidental pollution events.

Enbridge indicated that insurance would be provided by highly-rated insurance companies consistent with Enbridge's existing operational insurance. Each insurer is rated at least "A-", or better by A.M. Best, an insurance rating agency.

Abandonment Costs

Enbridge determined the abandonment cost estimate for the Line 3 Replacement Pipeline to be approximately $160 million. Enbridge submitted that it followed the estimating process developed by the Land Matters Consultation Initiative under the direction of the Board. Enbridge also indicated that, given the immaterial impact on tolls, Enbridge does not propose to adjust its abandonment cost estimate immediately. Rather, Enbridge proposed to update its abandonment cost estimate during a regular review.

Views of the Board

The Board is of the view that Enbridge has demonstrated that it currently has sufficient financial capability to meet its obligations arising from an incident on the Line 3 Replacement Pipeline.

In the event of an incident, Enbridge estimated that the resulting costs and damages from such an incident could reach $2 billion. As assurance, Enbridge described the financial resources available to meet such an obligation as including unencumbered cash, commercial paper, and bank credit facilities, as well as less immediate resources such as debt markets and eventually Enbridge's consolidated insurance program. At this time, Enbridge indicated that it has $3 billion in committed bank credit facilities with approximately $1.5 billion available. No Participant presented evidence to demonstrate that Enbridge is not capable of fulfilling its financial obligations.

In June 2016, the *Pipeline Safety Act* will come into force and will impose an absolute liability limit (without proof of fault or negligence) on Enbridge of $1 billion in the event of an unintended or uncontrolled release from one of its pipelines. It will also require Enbridge to maintain at least this amount in financial resources.

The Board notes that Enbridge has committed to maintaining sufficient financial capacity to finance a major incident, of up to $2 billion, on the Line 3 Replacement Pipeline for its entire operational life. Enbridge is required to honour this commitment and include it in its Commitment Tracking Table **(Certificate Condition 14** and **Section 58 Order Condition 11).**

Chapter 3

Design, Construction and Operation of the Line 3 Replacement Pipeline

The Board uses a risk-informed approach in regulating NEB facilities and activities to help ensure they are safe and secure from their initial construction through to their abandonment. In consideration of the safety and security of proposed facilities, the Board assesses whether the facilities are appropriately designed for the properties of the product being transported, the range of operating conditions, and the human and natural environment where the facilities would be located. Specific considerations include the company's approach to engineering design, integrity management, security, emergency preparedness, and health and safety.

3.1 Engineering Matters

When a company designs, constructs, operates or abandons a pipeline, it must do so in accordance with the OPR, the commitments made during the hearing, and the conditions attached to any approval. The OPR references applicable engineering standards. Pertinent to this Project is the Canadian Standards Association Standard Z662-15 Oil and Gas Pipeline Systems (CSA Z662-15). The company is responsible for ensuring that the design, specifications, programs, manuals, procedures, measures and plans developed and implemented by the company are in accordance with the OPR, which incorporates by reference CSA Z662-15.

3.1.1 Description of Facilities

Views of Enbridge

Enbridge submitted that the Line 3 Replacement Pipeline is approximately 1,096 km long divided into two segments. The first segment extends from the Hardisty Terminal in Alberta to the Cromer Terminal in Manitoba. The second segment extends from the tie-in point NW 9-9-26 WPM to the Gretna Station in Manitoba.

Enbridge indicated both segments of the Line 3 Replacement Pipeline will be made of steel grade 483 MPa (X 70) in accordance with CSA Z245.1-14 Category I, have an outside diameter (O.D.) equal to 914 mm (NPS 36), have minimum wall thicknesses of 11.8 and 12.7 mm and will be operated at a maximum operating pressure (MOP) of 9,930 kPa.

The Line 3 Replacement Pipeline will also consist of related physical works including:

- the installation of 55 new RSVs;
- the installation of 18 new pump stations and associated infrastructure and equipment;
- the construction of three new storage tanks located at the Hardisty Terminal; and
- associated interconnection work at facilities

Views of the Board

The Board requires Enbridge to file, within one year after commencing operations, Pipeline Geographic Information System (GIS) Data for both the Section 58 Facilities and Section 52 Pipeline and related Facilities **(Certificate Condition 34** and **Section 58 Order Condition 27)**

3.1.2 Design and Construction

3.1.2.1 Geotechnical Matters

Views of Enbridge

Enbridge submitted that:

- the Project is considered routine in terms of its geotechnical location;
- there are approximately 130 watercourse crossings along the Line 3 Replacement Pipeline;
- no assessment is required for the majority of the watercourses;
- site specific hydrotechnical assessments were required for 23 of the watercourses; and
- there are no areas of slope instability that are of concern for this Project.

Enbridge utilizes In-line inspection (ILI) tool technology to monitor pipeline stresses. An Inertial Navigation System and Inertial Measurement Unit on board the ILI tool performs three-dimensional measurement including azimuth, pitch and tool travel distance while the tool travels along the pipeline. Any deformation in the pipe can be calculated based on the three-dimensional measurements and compared to previous ILIs to monitor changes in the pipeline.

Enbridge submitted that its routine maintenance programs include RoW inspections (aerial or ground-based).

Enbridge stated that routine RoW inspections are used to identify any areas where slope instability might exist.

Enbridge also stated that in the event that slope instability occurs on or near the RoW in the future, the unstable slope(s) would be monitored regularly to assess the risk that future ground movements might affect the pipeline. The scope of such monitoring programs would depend on site-specific conditions, but can include: instrumentation, regular visual monitoring, pipe assessments, or a combination of those methods. Remediation and/or reconstruction projects will be implemented, as appropriate to ensure the ongoing integrity of the affected pipelines.

Enbridge stated that remote monitoring of slope movement would be considered if deemed required on a site-specific basis during detailed engineering. Enbridge's routine maintenance programs include RoW maintenance, which may include ground stabilization, erosion control, re-establishing appropriate depth of cover, re-grading land to appropriate contours, and/or revegetation.

Views of Participants

In the Gerry Kruk report submitted by the AMC, Mr. Kruk recommended that, to reduce the duration and volume of a potential pipeline spill into a waterway, Enbridge consider specific examples of design enhancements such as thicker pipe, review crossing locations, and trenchless river crossings.

Natural Resources Canada (NRCan) recommended that the NEB inquire about the fracture toughness test procedure that will be used by Enbridge for Strain Based Design (SBD) application, since not all currently available test procedures have been standardized, but information is available in the open literature and only a few laboratories currently perform the tests developed most recently.

NRCan also recommended that the NEB make an assessment on whether installation of the following would be beneficial:

- an online monitoring system using coupons and electrical resistance probes; or
- state of the art online monitoring techniques such as ultrasonics and/or fiber optics sensors.

Views of the Board

The Board acknowledges that Enbridge has not yet completed its geotechnical engineering and that Enbridge therefore cannot, at this time, fully demonstrate that it has proposed adequate mitigation measures for all potential sites for geohazards. For this reason, the Board requires Enbridge to file with the Board a report that includes a detailed description and scope of the mitigation necessary to protect the Section 52 Pipeline and related Facilities and RoW from future bank or slope failures **(Certificate Condition 20)**. Furthermore, the Board is requiring Enbridge to file a geotechnical report on slope stability **(Certificate Condition 28)**.

The Board has considered the recommendations made by NRCan regarding the NEB assessing whether the installation of certain online monitoring systems or techniques would be beneficial. The Board is not persuaded that there is a need to require Enbridge to install specific devices to monitor strain. The Board is of the view that through compliance with the conditions mentioned above, the NEB will have an opportunity to review the information provided by Enbridge on potential sites for geohazards and the mitigation measures planned to be implemented at each site. Based on Enbridge's submissions, the Board will take action if necessary. Furthermore, the Board notes that its regulations and ongoing compliance verification work already provide the Board with sufficient tools to manage issues that may arise with Enbridge's geohazards.

The Board is aware that Enbridge plans to implement some mitigation measures at crossings. For instance, Enbridge has taken into consideration the use of thicker pipe through its decision to install heavier wall pipe at crossings along the route of the Line 3 Replacement Pipeline where external forces, installation stresses and operational conditions could have an effect on the pipe. The increase in wall thickness will provide

additional strength in these locations. The Board is of the view that this consideration satisfies the recommendations made by Mr. Kruk regarding the design enhancement of thicker pipe.

The Board understands that because the Line 3 Replacement Pipeline is largely being constructed adjacent to Enbridge's mainline corridor, the route selection for this new line is limited. The Board is of the view that it is therefore unlikely that Enbridge will be able to significantly change the locations of the crossings, and as a result, Enbridge will not be able to meet the recommendations made by Mr. Kruk regarding the design enhancement of reviewing crossing locations. This being said, the Board does not share the same concerns raised by Mr. Kruk, given Enbridge's experience with the Existing Line 3 Pipeline and other pipelines in the corridor, combined with Enbridge's familiarity with the terrain and potential issues at each crossing.

The Board is of the view that the use of a trenchless crossing technique to install the pipeline at rivers is preferable since it results in a pipeline buried at much greater depths than a pipeline installed with an open cut crossing technique. A deeper pipeline is typically further away from the potential scour zone and less likely to be exposed over time. In its evidence, Enbridge did not specifically describe whether it has taken into consideration the effect of scour at every water crossing and whether it intends to bury the pipeline at a sufficient depth to prevent pipeline exposure caused by scour. The Board is addressing this outstanding concern by requiring Enbridge to bury the pipeline at a sufficient depth to prevent pipeline exposure during a 100-year flood event **(Certificate Condition 16)**. The Board is of the view that this condition also satisfies the recommendations made by Mr. Kruk regarding the design enhancement of trenchless river crossings. Furthermore, the Board requires Enbridge to file its watercourse trenchless crossings execution plan for review **(Certificate Condition 15)**. The execution plan is expected to include details on matters such as pipe handling, pipe installation, profile dimensions, and how Enbridge intends to minimize damage to the coating and overstressing of the pipe.

Enbridge designed the Line 3 Replacement Pipeline using conventional methodologies based on stress. For example, to determine the required pipe grade and thickness, Enbridge used the resistance of the pipe wall to the hoop stress induced by the intended internal operating pressure. Enbridge expressed that it will decide on whether to use another design method that uses strain rather than stress, that is SBD, in some specific locations along the route of the Line 3 Replacement Pipeline. It is the Board's understanding that with SBD, uncertainties exist in predictions related to potential ground movements, and variability in chemical and mechanical properties in the pipe and its welds. The Board therefore needs to review Enbridge's analysis and results if it decides to use this type of design. Accordingly, the Board requires Enbridge to file a summary of the analysis completed to determine if SBD is required and if so, to provide details **(Certificate Condition 7)**. The Board is of the view that this condition also satisfies the recommendations made by NRCan regarding the NEB inquiring about the test procedures that will be used by Enbridge for SBD application.

3.1.2.2 Valves

Views of Enbridge

Enbridge stated that it used its Intelligent Valve Placement (IVP) program to identify the most effective location for valves on the Line 3 Replacement Pipeline. The results were submitted to the NEB.

Enbridge stated that the IVP program optimizes valve locations along the pipeline in order to reduce the maximum potential release volume to as low as reasonably practicable along the entire pipeline, including at all watercourse crossings, mitigating the potential impacts to people and the environment.

Enbridge stated that it defines a major water crossing as, "a water crossing that is more than 100 feet (30 meters) wide from high-water mark to high-water mark."

Enbridge stated that through lessons learned on a number of other projects and changes made to CSA Z662, Enbridge refined its definition of major water crossing such that water courses that have annualized flow are also considered major water courses.

Enbridge stated that, other than annualized flow, Enbridge also takes into consideration other criteria to determine whether a water course is considered a major water course crossing and these are:

1. Direct and indirect impact to high consequence areas:
    a. drinking water;
    b. commercially navigable waterway;
    c. environmentally sensitive areas;
    d. high population areas; and/or
    e. other population areas.
2. Topography
3. Tributary path

In addition to the results of the IVP program, Enbridge stated that it also took into consideration the locations of valves currently installed on the Existing Line 3 Pipeline and valves currently installed on other pipelines sharing the same RoW such that existing sites are utilized to minimize environmental impact, road construction, power requirements, landowner issues, etc.

Enbridge indicated that 55 valves will be installed on the Line 3 Replacement Pipeline:

- 18 valves at pump stations (that is, one valve at every station);
- 8 valves for volume reduction purposes; and
- 29 valves at water crossings.

Enbridge indicated the 55 valves will be remotely controlled gate valves that can be closed manually in the field, if need be. Enbridge committed to ensuring strategic valve placement to minimize the potential volume of any spill.

Views of Participants

In the Gerry Kruk report provided by AMC, Mr. Kruk stated that Enbridge should be required to file with the NEB for approval, at least 6 months prior to commencing construction of the Line 3 Replacement Pipeline, its final valve location assessment for the pipeline that provides calculated maximum release volumes based on 10-minutes of pressurized release followed by another 3 minutes to fully close the valves.

Mr. Kruk indicated that Enbridge should use its IVP program to identify the most effective location for the valves based on their potential volume reduction, proximity to sensitive areas such as water crossings, drinking water sources, populated areas, and ecologically and otherwise sensitive areas. Also, in Mr. Kruk's view, Enbridge must explain why it believes that the maximum release volume between valves is as low as reasonably practicable including the impact of using manually operated valves instead of remotely operable valves. Mr. Kruk indicated Enbridge must submit the results of its IVP study prior to applying for Leave to Open (LTO).

The Kruk report also recommended that, to reduce the duration and volume of a potential pipeline spill into a waterway, Enbridge should consider specific examples of design enhancements such as additional block valves.

The Government of Manitoba requested that Enbridge adhere to the commitments made in its Application and supporting information regarding the strategic valve placement before and after watercourse crossings to minimize the potential volume of any spill, especially at the following crossings: Souris River, Oak Creek, Cypress River, Deadhorse Creek and Buffalo Creek.

Views of the Board

Based on CSA Z662 Clause 4.4.9, Enbridge is required to install valves on both sides of major water crossings and at other locations appropriate for the terrain in order to limit damage from accidental discharge. Major water crossings as described above are defined in CSA-Z662 Clause 4.4.9 Note 2) as, "water crossings that in the event of an uncontrolled product release poses a significant risk to the public or the environment." The Board is satisfied with Enbridge's more specific and comprehensive definition of major water crossing and the method it uses to decide whether to install valves on either side of a water crossing.

Enbridge has demonstrated that in some cases, major water crossings are naturally protected by either an elevation peak or a downward slope away from the crossing. The Board acknowledges that in these locations, valves would not minimize the potential amount of volume released in the event of a rupture and is of the view that Enbridge's strategy is justified. In light of the fact that, in addition to the valves to be installed to protect water crossings along the Line 3 Replacement Pipeline's route, Enbridge plans on installing valves at every station and several additional valves for volume reduction purposes, the Board is of the view that Enbridge exceeds current practices, and meets its commitments regarding strategic valve placement, which satisfies the request made by the Government of Manitoba. The Board is satisfied that Enbridge has carefully analyzed the placement of valves for the Line 3 Replacement Pipeline, and that it has taken into

consideration many variables to select the most appropriate locations for valves to reduce the negative effects of a potential leak, as much as possible.

The Board is of the view that Enbridge's strategy also meets the recommendation made by Mr. Kruk regarding identifying the most effective location of valves based on their potential volume reduction and proximity to sensitive areas, as well as his recommendation regarding design enhancement of installing additional block valves. Furthermore, the Board is of the view that through Enbridge's responses to IRs on its IVP program and by the filing of the results of its valve location assessment on the record, Enbridge has demonstrated that the maximum release volume between valves is as low as reasonably practicable, thus addressing the concerns raised by Mr. Kruk. Enbridge confirmed that all valves on the Line 3 Replacement Pipeline will be remotely controlled, which addresses Mr. Kruk's concern regarding the impact of using manually operated valves.

3.1.2.3 Pipe Toughness

Views of Enbridge

Enbridge stated that the CSA notch toughness category selected for the pipe that will be used to build the Line 3 Replacement Pipeline is Category I pipe with no proven notch toughness requirements.

Enbridge stated that its own pipe welding specification requires notch toughness properties to be tested on all Category I pipe orders using Charpy V-notch (CVN) and Drop-weight tear (DWT) testing. The results of which are reviewed by pipeline engineers prior to acceptance for installation.

Enbridge stated that the pipe produced as per its own pipe welding specification exceeds the requirements for CSA Z245.1 Category I pipe.

Views of Participants

NRCan recommended that the NEB review this information to ensure that sufficient crack initiation resistance toughness of the pipe steel and seam welds will be used to build the Line 3 Replacement Pipeline.

Views of the Board

The Board acknowledges that based on the CSA Z662 requirements, Enbridge is permitted to use CSA Z245.1 Category I pipe. The Board recognizes that the testing requirements that Enbridge imposes on all its purchased pipe leads to good product quality control practices and provides Enbridge with values for mechanical properties such as notch toughness. The Board is satisfied that Enbridge will have sufficient inputs for predictive calculations such as future defect growth rates and accepts Enbridge pipe material selection. In the Board's view, Enbridge's rationale for selecting Category I pipe meets NRCan's recommendations regarding toughness. The Board is not persuaded Enbridge needs to complete additional testing on the pipe and seam welds used to build the Line 3 Replacement Pipeline.

3.1.3 Quality Assurance

3.1.3.1 Joining Program

Views of Enbridge

Enbridge stated that field girth welding of line pipe for the Line 3 Replacement Pipeline will be done by automatic gas metal arc welding. Enbridge stated that section welding and tie-in welding for the Line 3 Replacement Pipeline will be done by semi-automatic self-shielded flux core arc welding (FCAW), mechanized FCAW or shielded metal arc welding using low hydrogen consumables.

Enbridge stated that a joining program, specific to the Project will be developed consistent with the OPR, Codes and Standards and welders will be qualified in accordance with the requirements of CSA Z662.

Enbridge stated that all welding will be conducted in accordance with its Pipeline Welding Specification and the requirements of CSA Z662.

Views of Participants

NRCan recommended that Enbridge provide the Board with information on Enbridge's Joining Program for the Board's review and assessment.

Views of the Board

According to section 16 of the OPR, a company is required to develop a joining program and to submit it to the Board when required to do so. In this case, and in accordance with NRCan's recommendation, the Board imposes a condition that Enbridge file its Project specific field joining program with the Board to assist it in, among other things, verifying compliance in the field **(Certificate Condition 21** and **Section 58 Order Condition 15)**.

During welding activities, the Board also requires Enbridge to maintain at each construction site a copy of the applicable welding procedures used on the Line 3 Replacement Pipeline **(Certificate Condition 24** and **Section 58 Order Condition 17)**.

3.1.3.2 Weld Inspection

Views of Enbridge

Enbridge stated that all field girth welds will be non-destructively inspected using ultrasonic or radiographic inspection methods.

Enbridge stated that the primary non-destructive testing (NDT) method for all mainline, section, repair and tie-in welds will be automated ultrasonic testing (AUT) supplemented by visual inspection. Time of Flight Diffraction AUT techniques will be used as the primary delay NDT method. Radiographic testing will be conducted on all welds that cannot be inspected using AUT and for supplementary testing of welds inspected using AUT when required.

Enbridge stated that non-destructive examination (NDE) such as visual inspection and X-ray or ultrasonic inspection are completed on 100% of all girth welds at the time of construction.

Enbridge stated that Annex K of CSA Z662 will be considered for alternative flaw acceptance criteria of the GMAW girth welds.

Enbridge stated that for the mainline welds that will go through the hydrostatic process; the NDT will be conducted the same day of the weld completion.

In addition, Enbridge submitted that for the final tie-in welds that will not go through the hydrostatic process, the NDT will be conducted a minimum of 18 hours after the weld completion. The delay timing of a minimum of 18 hours following weld completion is based on the position that any latent weld defects will have developed to a detectable size by the specified NDT method within the identified timeline.

Views of the Board

According to section 17 of the OPR, when a company conducts joining on a pipeline, it is required to examine the entire circumference of each joint by radiographic or ultrasonic methods. Enbridge's commitments regarding the inspection of all field girth welds is consistent with the requirements of the OPR for joining. During welding activities, the Board also requires Enbridge to maintain at each construction site a copy of the applicable NDE and testing procedures used on the Line 3 Replacement Pipeline; and all supporting documentation related to NDE and testing **(Certificate Condition 24** and **Section 58 Order Condition 17)**.

Although Annex K of CSA Z662 is not mandatory, this section of the CSA Standard has gone through and continues to go through rigorous review and development. The Board finds it prudent that Enbridge is considering Annex K, since it reflects an approach based on industry and regulator experience and input.

The Board acknowledges that not all field welds can be hydrostatically tested (for example, final tie-in welds). For those welds that will not experience a hydrostatic test, it is recommended that NDE be done after a certain period of time after the welding is completed to allow for the detection of delayed cracking that can potentially develop in the welds. Enbridge stated that it intends to wait 18 hours before conducting NDE of final tie-in welds. In the Board's view, a longer delay time for conducting NDE would be prudent in the circumstances; therefore, the Board requires Enbridge to delay NDE of final tie-in welds and any repairs to them for 48 hours following completion of welding **(Certificate Condition 24** and **Section 58 Order Condition 17)**.

3.1.3.3 Pressure Testing

Views of Enbridge

Enbridge stated that the NDE on all girth welds at the time of construction is followed by a hydrostatic test.

Enbridge submitted that according to the "Preliminary Pipeline Pressure Testing Plan" performed by Worley Parsons Canada Services Ltd. (Testing Plan), there are no extraordinary measures required, because the pipelines will be tested with fresh water and no gaseous test media will be used. In addition, according to the Testing Plan, based on experience of previous projects, the planned strength test pressures should correspond to stress levels between 100% and 110% of the specified minimum yield strength (SMYS) of the pipe. The latter mirrors the requirement in CSA Z662 for the maximum strength test pressure. This level will allow the pipeline to be licensed for operating pressures corresponding to 80% of the SMYS of the pipe, which are the highest operating stress levels allowed by CSA Z662.

Views of the Board

According to section 23 of the OPR, before putting a pipeline into service, a company shall develop a program in respect of pressure tests to be conducted for pipe and components used in its pipeline and shall submit it to the Board when required to do so. The Board imposes a condition requiring Enbridge to file its Project specific pressure test program, prior to commencing the pressure tests **(Certificate Condition 22** and **Section 58 Order Condition 16).**

According to CSA Z662 Clause 8, piping is required to be pressure tested in-place after installation and before being put into operation. Enbridge's commitments regarding pressure testing are consistent with the requirements of CSA.

3.1.3.4 Baseline In-Line Inspection

Views of Enbridge

Enbridge stated that as part of its standard practice, it conducts baseline ILI on all newly constructed pipelines. Baseline ILI for this Project will include the following:

a) high resolution geometry inspection (target within 12 months of the in-service date);
b) crack inspection (target within 12 months of the in-service date);
c) metal loss inspection (target within 12 months of the in-service date);
d) alternating Current Voltage Gradient (ACVG) or Direct Current Voltage Gradient (DCVG) inspections (this type of inspection cannot be completed within the first six months due to soil resistivity and compaction, a minimum of 6 months after backfill is required for the soil to settle around the pipe); and
e) above-ground coating survey (within two years after line fill).

Enbridge stated that high resolution geometry tools are used as they can accurately size, locate and report geometry features along with pipe strain and curvature information. The results of

these runs are also compared with subsequent surveys to determine if movement has occurred at any point on the line.

Ultrasonic crack detection tools are used to detect cracking features including stress corrosion cracking (SCC) and weld cracks. The results of the baseline ILI are used to identify and repair any identified manufacturing or construction defects. The results are also used to provide a baseline in the calculation of potential growth.

Metal loss inspections locate pipe wall features resulting from corrosion, gouging and any generalized feature that interferes with the uniformity of the pipe wall thickness.

The use of these tools ensures a comprehensive inspection and baseline of the primary integrity threats.

Views of Participants

Both NRCan, and the Kruk report submitted by AMC recommended that Enbridge conduct a baseline ILI survey.

Views of the Board

Hydrostatic testing for all new construction is conducted to eliminate defects or imperfections introduced in the pipe at the time of its manufacturing or during the transportation, handling and construction activities. If defects or imperfections fail during the test, that is if leaks or ruptures occur, the pipe is repaired and as a result the defects or imperfections are removed. If defects or imperfections are not severe enough to fail during the test, they will remain in the Line 3 Replacement Pipeline and have a potential to grow during operation. Though a baseline ILI is not mandatory, it represents an opportunity for Enbridge to detect defects or imperfections remaining in the pipe after the hydrostatic test. The Board is of the view that Enbridge's commitment to conducting these inspections is prudent and satisfies the recommendations made by NRCan and Mr. Kruk.

3.1.4 Integrity Management

3.1.4.1 Corrosion and Cracking

Views of Enbridge

Internal Corrosion

Enbridge stated that the transported hydrocarbons do not contain significant corrosive or abrasive properties and are not considered to be sour service. Enbridge's practice is to confirm that the product remains corrosive and abrasive free by collecting product samples at all incoming custody transfer locations.

Enbridge stated that should operations indicate a higher internal corrosion susceptibility level, or if unexpected internal corrosion is observed, Enbridge will implement additional measures to mitigate the corrosive environment including: adjustments to operating conditions, cleaning schedule, or injection of inhibitor.

External Corrosion
Enbridge stated that the new buried pipeline will be coated with Fusion Bonded Epoxy (FBE) to inhibit external corrosion. Above-ground pipe will be painted for the same purpose. Field girth welds (welds used to join pipe segments together), will be coated as well with a liquid epoxy resin, or polyethylene heat shrink sleeves.

Enbridge stated that a cathodic protection (CP) system will be installed for the new pipeline, and all underground steel components.

Cracking
Enbridge stated that cyclic fatigue is identified through pressure monitoring programs and mitigative measures are undertaken to reduce cyclic fatigue.

Enbridge stated that short lengths of heavy-wall pipe will be needed for crossing railways, roads, significant rivers, and other areas.

Views of the Board

The Board requires Enbridge, like all companies, to evaluate its pipeline system to determine whether it is susceptible to all integrity hazards such as internal, external corrosion, cracking, and other issues that may impact the integrity of the pipeline. When a pipeline is susceptible to a given integrity hazard, the operating company is required to manage the hazard suitably. On the other hand, when a pipeline is determined to not be susceptible to a given integrity hazard, a justification is needed and the operating company is expected to regularly review the pipeline's conditions to verify if its susceptibility has changed and to react accordingly.

Internal Corrosion
Enbridge provided an appropriate justification as to why it does not consider the Line 3 Replacement Pipeline to be susceptible to internal corrosion. Furthermore, Enbridge proposed to routinely verify the susceptibility of the Line 3 Replacement Pipeline to internal corrosion through its product sampling program (that is, if at some point in time the transported product is determined to be more corrosive, the Line 3 Replacement Pipeline will be considered more susceptible to internal corrosion). Enbridge proposes to design the Line 3 Replacement Pipeline such that cleaning pigs can be run and corrosion inhibitors can be injected into the pipeline system in the event that additional controls for internal corrosion are needed.

External Corrosion
According to CSA Z662 Clause 9, buried piping is required to be externally coated and cathodically protected. The external corrosion control methods proposed by Enbridge are consistent with the requirements of CSA.

Cracking
Enbridge did not provide significant details on how it intends to limit the amount of internal cyclic loading on the pipeline, other than stating that it will be achieved through pressure monitoring programs and mitigative measures. However, the Board is of the view that advancements in the technology of pressure control such as the use of a

variable frequency drive (VFD) to control the pump motor have significantly decreased the loading cycles and vibrations experienced by pipeline systems. Enbridge proposes to install a VFD at every pump station.

Enbridge is taking measures to counteract the effects of external cyclic loading at locations where the pipeline will experience regular external pressure (such as the stress coming from vehicle traffic at road crossings) through installing thicker pipe at crossings.

Enbridge did not provide its views on material specifically as a way to control the hazard of cracking. However, the Board recognizes that, because of modern steel making techniques and advancements in manufacturing processes, the Line 3 Replacement Pipeline will be built with high quality materials that exhibit good fracture toughness properties and are expected to have adequate resistance to cracking. Furthermore, the materials selected to coat all exterior surfaces such as pipe body and field girth welds are appropriate for corrosion control and for isolating the pipe from environments that cause cracking. In the Board's view, materials and coatings provide the first line of defense against potential cracking. Accordingly, the Board is satisfied that the materials and coatings chosen by Enbridge for the Line 3 Replacement Pipeline will reduce the probability of a failure due to cracking.

3.1.4.2 In-Line Inspection

Views of Enbridge

Enbridge stated that ILI is used to measure the size, frequency and location of defects. Defects are analyzed and monitored through regular inspections. The inspection intervals are set based on the integration and analysis of numerous data sets.

Enbridge indicated that the corrosion inspection monitoring plan includes the regular use of three unique ILI metal loss (corrosion) detection technologies including:

- magnetic flux leakage (MFL);
- circumferential magnetic flux leakage (MFL); and
- ultrasonic wall measurement (USWM).

These ILI tools can detect metal loss along the entire length of the pipeline.

Enbridge expressed that the integrity management plan also includes threat integration (overlapping several ILI results) to ensure anomalies are appropriately classified and sized.

Enbridge submitted that investigative excavations are conducted as a result of anomalies identified by ILI (the selection of a specific location is based on a direct assessment approach), or in conjunction with some other maintenance activity. Investigative excavations are also used to obtain information related to soil types, water, topography, coating condition and other characteristics in order to develop a better understanding of the root cause of a pipeline defect.

Enbridge stated that ultrasonic crack detection tools are used to detect cracking features including stress corrosion cracking and weld cracks.

Views of Participants

NRCan recommended the NEB obtain information on the accuracy of the ILI tools, the frequency at which they will be used and whether that frequency will be sufficient for timely detection of cracks to avoid ruptures.

Views of the Board

In the Board's view, Enbridge has demonstrated, through its commitment to monitoring corrosion and cracking by routinely running ILI tools that specialize in detecting metal loss and cracking features; and by undertaking investigative excavations as needed, that these hazards will be given appropriate attention throughout the lifecycle of the Line 3 Replacement Pipeline.

The Board acknowledges that due to many factors, the actual accuracy of defect size and location may not be consistent with the stated ILI tool specifications and shares the concerns raised by NRCan on this matter. However, Enbridge has committed to overlapping the data and results collected during various integrity assessment activities such as ILI tool runs, investigative excavations, pipe-to-soil surveys and routine maintenance. In this manner, the Board is of the view that Enbridge will be able to intervene in a timely manner before defects or imperfections reach critical sizes. The Board is satisfied that Enbridge will be assessing the integrity of the Line 3 Replacement Pipeline by not only relying on ILI tool run data, but also on other integrity assessment activities.

The Board understands that at this point in time, Enbridge cannot commit to a pre-determined ILI schedule, and therefore, cannot meet the recommendations made by NRCan regarding the NEB obtaining information on the frequency of use of the tools. However, the Board understands Enbridge will routinely assess the integrity of the Line 3 Replacement Pipeline, and continually adapt the integrity management program activities as data becomes available and is integrated. In the Board's opinion, imposing a pre-determined frequency for running ILI tools on Enbridge will not add value and is more prescriptive than necessary. Furthermore, the Board notes that the OPR and its ongoing compliance verification work provide the Board with sufficient tools to manage issues that may arise with Enbridge's ILI strategy.

3.1.4.3 Repair Criteria

Views of Enbridge

In the event that defects are identified on the Line 3 Replacement Pipeline, Enbridge submitted that mitigative measures include: sleeve repairs, pipe replacements, pressure reductions, rehabilitation, and/or inhibitor injections, depending on the specific situation.

Enbridge stated that, as a matter of standard practice, it excavates and repairs all post-construction dents greater than 2% of the nominal pipe diameter for 12 inch (outside diameter 323.9 mm) and larger. This will include the pipe installed for the Line 3 Replacement Pipeline, which has a nominal pipe diameter of 36 inches (914.4 mm). In addition, Enbridge submitted that it excavates and repairs ovality greater than 5% of the nominal pipe diameter as well as top dents that occur above the 4:00 and 8:00 position (upper two thirds), greater than 1%.

Views of Participants

In the Gerry Kruk report submitted on behalf of the AMC, it was recommended that Enbridge investigate all dents greater than 2% of pipe diameter.

> ***Views of the Board***
>
> According to CSA Z662, companies are required to evaluate any imperfection found in steel piping to determine the suitability of such piping for continued service. CSA Z662 provides specific guidelines for the evaluation of imperfections such as corrosion, gouges, dents, cracks and for determining whether these imperfections are defects that require repair. CSA Z662 also specifies acceptable repair methods depending on the defect. The Board notes that Enbridge's repair criteria exceed the CSA Z662 requirements and satisfy the recommendations made in the Kruk report regarding the investigation of dents.

3.1.5 Operations

3.1.5.1 Back up Power

Views of Enbridge

Enbridge stated that every pump station will be equipped with a backup power system such that control of the Line 3 Replacement Pipeline will be constantly maintained and that equipment used to shut down the pipeline system will remain operable in the event that the primary electrical supply is interrupted.

The backup power for some critical systems such as the SCADA system will be provided by an Uninterruptible Power Supply (UPS), while for other equipment such as valves, the back-up power will be provided by a generator.

A UPS is an electrical apparatus that provides near instantaneous protection from power interruptions by supplying energy stored in devices such as batteries, while a generator provides power to connected equipment with a certain time delay. Enbridge submitted that it takes approximately five seconds for the generator to start-up and provide power to connected equipment.

Views of the Board

The Board is satisfied that, in the event of a power outage, Enbridge plans on providing seamless power to the SCADA system through a UPS type of backup power. The Board finds it reasonable for Enbridge to connect other critical equipment such as valves to a generator type of backup power. Even though there will be a delay between the power outage event and the generator providing power to the connected equipment, the Board is of the view that a delay of five seconds is relatively short and acceptable.

3.1.5.2 Over Pressure Protection System

Views of Enbridge

Enbridge indicated a system referred to as the line pressure monitor (LPM) verifies discharge pressure at one station and the suction pressure at the downstream station. The LPM can initiate set-point reductions, unit shutdowns at the upstream station, or entire line shutdowns if a section of the pipeline exceeds the operating pressure limits.

Enbridge stated that in the event that any of the sectionalizing valves begins to close, the pipeline control logic system will take action to shut down the entire pipeline system to avoid the operating pressure exceeding the licensed MOP.

Enbridge stated that at a single station, only the station's own suction and discharge pressures will be available to the local station controller. This implies that the local station controller cannot take actions based on the suction pressure of the station downstream or the discharge pressure of the station upstream. Instead, Enbridge relies on the pipeline control logic system to view all of the pressures available along the line and take corrective action across a series of stations as required.

Enbridge stated that the pipeline control logic system is complemented by several independent systems. Each station has a Discharge Backup Shutdown setting that is set higher than, and acts independently from the pipeline control logic system. In addition, select facilities have bypass lines with check valves and mainline pressure relief, as required. These systems and facilities work together to provide overpressure protection to the relevant pipeline during steady-state and abnormal operating conditions.

Views of the Board

The Board is of the view that the Line 3 Replacement Pipeline will be well equipped to prevent overpressure occurrences. The Board reminds Enbridge that instrumentation along the Line 3 Replacement Pipeline must have the correct set points in order to avoid any undesirable events and to remain within the operating design limits.

3.1.5.3 Leak Detection System

Views of Enbridge

Enbridge stated it uses the following four techniques to detect leaks:

- controller monitoring;
- visual surveillance and reports;
- scheduled line balance calculations; and
- computational pipeline monitoring (CPM)

Enbridge submitted that the controller monitoring technique consists of controllers that monitor pipeline conditions through the SCADA system to identify any unexpected operational change such as a pressure drop, which could indicate a leak.

Enbridge stated that the visual surveillance and reports technique involves the following:

- conducting aerial and ground line patrols of its pipelines;
- maintaining an emergency telephone line through which third parties can report oil leaks and odours; and
- implementing a public awareness program with affected public and emergency officials.

Enbridge stated that the schedule line balance calculations technique refers to calculations of oil inventory at fixed intervals, typically every two and 24 hours to identify any unexpected losses of pipeline inventory, which may indicate a leak.

CPM is a technique that uses an algorithm to detect anomalies in pipeline operating parameters (pressure, flow rate, temperature) that could indicate a leak. Enbridge stated that the type of CPM that it uses is called the Material Balance System (MBS). The MBS utilizes measurements collected by the SCADA system to model the state of the pipeline in real time. The MBS continuously calculates volume imbalances. When an imbalance is detected, an alarm is activated at the Enbridge Control Centre (ECC).

Enbridge stated that the two primary measures of a leak detection system's effectiveness are sensitivity and reliability and Enbridge seeks to maintain continuous improvement in these measures. Enbridge has recently completed a multi-year program to improve the instrumentation it uses for leak detection, which has resulted in significant improvement to CPM sensitivity. In the area of reliability, improvements to the systems have resulted in an average reliability improvement of 30% per year and Enbridge indicated 2015 is on target to achieve at least the same.

Enbridge submitted that the sensitivity of the CPM system is estimated to be 3% of nominal flow at which point an alarm would be generated. This would equate to a volume of approximately 300 m^3 (300,000 L) over a two-hour period or a leak rate of 150 m^3 (150,000 L) per hour (approximately 42 L per second).

Enbridge stated that leaks below the minimum detectable threshold for the CPM are detected through the other leak detection methods.

Enbridge stated that over the last five years, it has conducted 19 Fluid Withdrawal Tests at various locations across its pipeline systems. All of the fluid withdrawals were successfully detected by the CPM and alarms generated accordingly. Enbridge stated that the Existing Line 3 Pipeline was tested in December 2012 and again in May 2014. The results of both tests were successful with the CPM system generating alarms at all tested fluid withdrawal flow rates, and the pipeline was shut down within the defined time limits.

Enbridge performed an evaluation of two different acoustic in-line inspection leak detection technologies and has selected a new technology with the capability of detecting small release volumes. This technology is complementary to the other leak detection methods outlined above. Enbridge will employ this acoustic in-line leak detection technology when appropriate, to assist in the detection of leaks.

Enbridge stated that it is currently reviewing the effectiveness of various types of externally based leak detection technologies, including vapor sensing tubes, fiber-optic distributed temperature sensing systems, hydrocarbon-sensing cables, and fiber-optic distributed acoustic sensing systems, as well as aerial and pressure wave based leak detection technologies. These initiatives are currently governed by a Joint Industry Partnership, which includes Enbridge and other pipeline companies.

Enbridge stated that it will decide whether to use additional leak detection methods based on the results of the reviews, provided that it contributes to a measurable improvement to leak detection performance and substantively reduces risk.

Although Enbridge has historically been successful in managing the risk of column separation, Enbridge is planning to install a suite of new instrumentation for the Project including additional flow, pressure, and temperature measurement that will contribute to enhancing the ability to detect leaks, including at locations where there is a higher risk of column separation.

Views of Participants

NRCan questioned the possibility of installing additional leak detection techniques, how the leak detection system responds to alarms and whether Enbridge is planning on installing the same leak detection system on the Line 3 Replacement Pipeline, as for other Enbridge pipelines.

In the Gerry Kruk report submitted by AMC, Mr. Kruk indicated if the Line 3 Replacement Pipeline were approved, Enbridge should be required to file with the NEB, at least 90 days prior to commencing operations, a report describing the final design of the pipeline's SCADA and leak detection systems. The report should be required to include information that would be helpful to establish a baseline for the quality program for these SCADA and leak detection systems.

Mr. Kruk also recommended that Enbridge file a report with the NEB, on or before a particular annual date after the first, third, and fifth full years after commencing the operation of the Line 3 Replacement Pipeline, and every fifth year thereafter, that describes the results of its quality program for its SCADA and leak detection systems and how identified issues were addressed.

In addition, Mr. Kruk recommended Enbridge add a fifth Leak Detection System (LDS) to the four already identified by Enbridge: the regular use of acoustic ILI's to detect very small leaks; and, to reduce the duration and volume of a potential pipeline spill into a waterway, Enbridge consider specific examples of design enhancements such as complementary leak detection systems.

Further, the Kruk report raised some concerns regarding slack flow (or column separation) and its impact on the leak detection system.

Views of the Board

The Board recognizes that Enbridge's workers are already accustomed to the systems and programs that Enbridge plans to use on the Line 3 Replacement Pipeline, given that it will be integrated into Enbridge's existing SCADA system and integrity management program. In the Board's opinion, Enbridge will be able to easily incorporate the Line 3 Replacement Pipeline within its current operations.

The Board is of the view that, through its responses to IRs on the reliability of its leak detection system, Enbridge has answered NRCan's question regarding the leak detection system's response to alarms.

The Board understands that, considering the numerous instrumentation devices that will be installed at several locations along the route of the Line 3 Replacement Pipeline, Enbridge's various systems will constantly obtain pertinent operational data that will enable Enbridge to detect and locate leaks.

The Board recognizes that there are limitations to the CPM leak detection technique in that it can only detect leaks that are at least 3% of the flow rate. Enbridge must therefore rely on its other leak detection techniques to locate a leak below this minimum flow rate. It is the Board's understanding that when a leak is above the 3% threshold, it takes the CPM leak detection technique a certain amount of time to detect a leak and this timing highly depends on the flow rate of the leak (that is, the higher the flow rate, the quicker the detection).

Although Enbridge did not commit to installing any externally based leak detection technologies on the Line 3 Replacement Pipeline, the Board notes that Enbridge is currently looking into several different types of these leak detection techniques and will determine whether one or more are appropriate for the Line 3 Replacement Pipeline. The Board is of the view that this initiative satisfies the recommendations made by NRCan and Mr. Kruk regarding complementary leak detection systems. The Board is confident that with the use of the four proposed internally based leak detection techniques and the occasional use of a complementary leak detection technique (that is, an acoustic in-line leak detection technology), Enbridge will be well equipped to detect leaks.

The Board is not persuaded that there is a need for Enbridge to file a report describing the final designs of the SCADA and leak detection systems; and, a report that describes the results of its quality program for its SCADA and leak detection systems as per Mr. Kruk's recommendations. Furthermore, the Board notes that the OPR and its ongoing

compliance verification work already provide the Board with sufficient tools to manage issues that may arise with Enbridge's systems.

It is the Board's understanding that significant changes in elevation along liquid transmission pipeline routes make them susceptible to column separation. Separation of the fluid column (slack flow) can result in leak detection system inaccuracy. Given that the topography of the route for the Line 3 Replacement Pipeline does not demonstrate significant changes in elevation, it is not expected to be susceptible to column separation or slack flow conditions. Furthermore, Enbridge is already familiar with elevation profiles along the route for the Line 3 Replacement Pipeline and the operational needs to minimize slack flow within the pipeline. The Board is convinced that column separation will be well managed on the Line 3 Replacement Pipeline and will not negatively impact the performance of Enbridge's leak detection system. The Board, therefore, does not share the concerns raised by Mr. Kruk regarding slack flow and its impact on the leak detection system.

3.1.5.4 Emergency Shutdown System

Views of Enbridge

Enbridge stated that the emergency shutdown (ESD) system can be initiated remotely by the ECC or locally (that is, at pump stations) by on site personnel if any unsafe condition is observed. If the ESD system is activated locally at a pump station, the SCADA system initiates a shutdown of pumps and the closure of valves to isolate the pump station and notifies the ECC.

The ESD system may be initiated automatically. Two examples of conditions that trigger automatic shutdowns are:

- the presence of lower explosive limits (LEL) or fire being detected at a pump station; or
- if any of the sectionalizing valves beginning to close.

In the event that the ESD system was initiated, because of equipment malfunctions (false alarms), the operators at the ECC will need to verify that the equipment has been repaired, and the trip mechanism has been manually reset, before operation can resume.

Views of the Board

The Board is satisfied that the Line 3 Replacement Pipeline will be equipped with an ESD system that will allow parts or all of the system to be shut down in the event of an emergency. The Board is also satisfied that the ESD will be accessible within the ECC and at all pump stations.

3.2 Emergency Response Matters

3.2.1 Enbridge's Emergency Preparedness and Response Planning

As required by the OPR, companies must develop, implement and maintain effective management systems and protection programs in order to anticipate, prevent, manage and mitigate conditions that may adversely affect the safety and security of the company's pipelines, its workers, the general public, as well as property and the environment.

With respect to emergency response matters, and in accordance with Sections 6 to 6.5 and 32 to 35 of the OPR, companies are required to develop and implement emergency management systems and programs for all aspects of their operations to minimize the effects of incidents and emergencies that have the potential to impact the health and safety of the public, company employees or workers, property and the environment. The Board developed the Guidance Notes for the OPR to assist companies in understanding its requirements. Further information on an emergency management program is provided in Annex A of the OPR Guidance Notes.

Views of Enbridge

Enbridge submitted that its Emergency Management Program includes risk assessment, emergency procedures manuals, first responder liaison programs, continuing education and public outreach programs, emergency response training and exercises, incident and response evaluations, and emergency response equipment. Emergency Management Program elements are updated as required to support new construction prior to operations.

Enbridge further stated that it has in place a comprehensive emergency preparedness and response program in accordance with its Environment Health and Safety Policy and section 32 of the OPR. The emergency preparedness and response program consists of:

- an Emergency Response Plan (ERP);
- a response management system;
- training and spill response exercises; and
- spill response resources for the pipeline.

Enbridge maintains a geographically based ERP that includes:

- information pertaining to notification requirements;
- emergency checklists and contacts;
- response team organization;
- facilities and pipeline information;
- Material Safety Data Sheets;
- health and safety plans; and
- route maps depicting control points and environmentally sensitive areas.

In addition, Enbridge stated that a Project-specific ERP will be prepared for construction and commissioning activities. The existing operations ERP will be revised to reflect the response requirements of the expanded system in advance of starting operations.

Views of Participants

Canupawakpa and Dakota Tipi asked if there was an Emergency Response Plan specific to their communities.

The Government of Manitoba asked if Enbridge will commit to including contact information for the water system operators of the Portage la Prairie and Cartier Regional public water systems, and instructions to contact the operators in the event of a spill, or loss of fluid or material at or near the crossing. In addition, the Government of Manitoba asked Enbridge to commit to have preparations and plans in place to ensure that it can respond to any pipeline accident, spill or release within two hours of discovery; commit to annual emergency exercises with Manitoba; and, provide training and equipment regarding spill response and fire suppression to appropriate provincial staff.

The Government of Manitoba submitted that Enbridge must work with the province to provide a timely, efficient and coordinated response to spills. The Government of Manitoba requested that Enbridge be required to adhere to the commitments made in its Application and supporting information regarding emergency response, including the following conditions if the Project were approved:

a) Establish and maintain in Manitoba an effective emergency response presence. Identify the Enbridge staff who will be responsible for Enbridge's emergency response to any environmental accidents associated with the pipeline. It is further expected that this staff will conduct annual training exercises within Manitoba in conjunction with Manitoba emergency response staff. Enbridge must also agree to work with Manitoba to ensure that there is an effective, timely and coordinated emergency response to spills or any other environmental accident associated with the pipeline;
b) Maintain up to date information on all registered groundwater wells that could potentially be affected by a spill;
c) Provide for the timely notification of well owners in the event of a spill in any emergency response plans;
d) Prepare detailed plans for rapid identification and management of impacts to groundwater drinking water supplies; and
e) Maintain highly trained emergency response staff and appropriate spill response and fire suppression equipment at strategic locations in the vicinity of the pipeline to ensure rapid response times to spills.

AMC requested that Enbridge provide details on planned emergency responses for both Souris River and Oak Lake oil releases, including, but not limited to: where responders are dispatched from, estimated timeframe to reach the spill site, equipment utilized by the responders, measures to deal specifically with complications met during the winter, and training provided to the responders. AMC also requested Enbridge list local authorities (police, fire brigade) that would be contacted in the case of a spill release in the region of Souris River or Oak Lake.

AMC stated that Proponents should create Emergency Response Plans in consultation with First Nations people and governments. All training and emergency response exercises must be extended to affected First Nation governments and nations.

In Mr. Kruk's report submitted by AMC, two recommendations were made regarding Emergency Response:

1. Enbridge should refine and enhance its comprehensive Emergency Response Plans with Tactical Response Plans, which are site-specific and therefore more detailed ERP's for select high consequence areas and for selected scenarios.

2. Emergency response training and exercises; two challenging full scale exercises, including one that must be unannounced should be conducted.

In Dr. Patricia Fitzpatrick's report, also submitted by AMC, she recommended augmenting Enbridge's Environmental Protection Plan (EPP) sections on Emergency Planning & Spill Response. Dr. Fitzpatrick stated that Enbridge should strengthen the EPPs to more clearly communicate and better address community-specific emergency planning, including addressing questions related to spill response. In her view, a more proactive plan would strengthen the EPPs. She recommended Enbridge develop a planning protocol immediately rather than wait for an emergency to occur.

Pine Creek First Nation (Pine Creek) submitted that Enbridge be transparent about its oil spill emergency plans and remediation plans and that a plan be in place to mitigate disasters.

For any emergency event, Health Canada submitted that the protection of human health should be considered a primary consideration in the development of emergency preparedness and response plans. Health Canada suggested several considerations to protect human health including measures to limit human exposure, lag times for contaminants to appear in country foods and other environmental media, and identifying human receptors as a key criterion for determining response times and actions.

Samson stated that it would like full disclosure of all emergency response plans and how it will be included in that response plan.

Keeseekoose First Nation (Keeseekoose) submitted that Enbridge should consult with it periodically and in a timely manner with respect to the general operation of the Line 3 Replacement Pipeline and periodic emergency response updates and changes.

Reply of Enbridge

In its reply to Canupawakpa and Dakota Tipi, Enbridge stated that it does not have an emergency response plan that is specific to their communities, or to any other communities along its RoW. Enbridge advised that emergency response documents, including its Integrated Contingency Plan and Emergency Response Action Plan, are designed to provide one standard set of procedures and a flexible response structure that can be modified and adjusted based on the nature and specifics of an incident and its location. In the event of an emergency response, Enbridge stated that it would work closely with local area first responders.

In its reply to the Government of Manitoba, Enbridge committed to including the water system operators of the Portage la Prairie and Cartier public water systems in the next EPP update for the Line 3 Replacement Pipeline, and the next emergency response procedure update (scheduled for Q4 2015) for operating pipelines. Enbridge also committed to contacting the operators in the event of a spill, or loss of fluid or material at or near the crossing.

Enbridge stated that there are no Canadian regulatory requirements for response times; however, the US Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) sets response time thresholds for pipeline operators to identify available response resources. Enbridge submitted that its response time falls well within the PHMSA requirements. Enbridge indicated it conducts several annual Emergency response exercises in and around its operations throughout Manitoba and will continue to extend invitations to its response partners in Manitoba to attend these emergency response exercises.

Enbridge committed to continuing to provide its Emergency Responder Education Program (EREP) and 911 Dispatch Module to appropriate provincial staff. In addition, Enbridge submitted that it will continue to engage government and response agencies in joint exercises to practice respective processes and form relationships that are needed during a response.

Enbridge advised that it engages local fire departments in the awareness of its fire suppression systems at its facilities. As part of the public consultation for the introduction of Enbridge's new Emergency Preparedness Manual, called the Integrated Contingency Plan (ICP), Enbridge indicated it has provided stakeholders, including first responders, information on the location of pipelines and Safety Data Sheets about the product shipped within those lines. Enbridge also indicated it supports communities in training and equipment needs with Safe Community Grants.

In addition, Enbridge stated that it clearly sets forth the expectations of working with Fire Departments and Government agencies through an ICS (Incident Command System) unified command structure in all emergency responses. One of Enbridge's key roles is the responsibility for containment and recovery, a role not expected of community first responders. As the responsible party, Enbridge is required to contain, recover, and remediate all releases to regulatory standards. Enbridge advised that these roles are contained within Enbridge's training program.

Enbridge also submitted that it has identified the audience for communications regarding emergency response activities as those agencies whose service areas cross or are immediately adjacent to the Enbridge RoW. Enbridge indicated it communicates a range of information through its Public Awareness Program to emergency response agencies. Through annual Public Awareness Program consultations with stakeholders, Enbridge collects information in order to better understand its emergency response capabilities and processes so that it can plan accordingly.

Enbridge stated that as of 2014, lessons learned from emergency response exercises have been captured using the Emergency Response Exercise Action Tracker (EGRET). EGRET stores exercise documentation and allows the Exercise Director to assign Improvement Plan action items electronically to designated staff members. These action items may involve incorporating improvements into the emergency management program.

In replying to the questions raised by AMC and specifically recommendation 11 from Mr. Kruk's report, Enbridge stated that it has developed a new Integrated Contingency Plan (ICP) for the Central Region Response Zone and an associated Emergency Response Action Plan, which addresses the elements outlined in the recommendation. Enbridge also identified detailed tactical response strategies (Control Point Mapping) that guides emergency response in specific areas, types of watercourses and water bodies.

With respect to recommendation 12 in Mr. Kruk's report, Enbridge stated that as part of its standard practice, it conducts emergency response exercises to test the effectiveness of its emergency response plans and ICPs and of its personnel training programs. Enbridge indicated it conducts several annual emergency response exercises in and around its operations in Manitoba. Enbridge advised that it maintains exercise records, which are available to the Board upon request.

Regarding the first recommendation set out in Dr. Fitzpatrick's report, Enbridge stated that it has several systems in place to proactively manage the safe construction, operation, maintenance and long-term integrity of its pipelines and facilities, including measures for spill prevention and spill response. Communication regarding community-specific emergency planning occurs through a number of avenues, including Enbridge's public awareness program, local first responder training programs, and its ongoing Aboriginal engagement program.

Views of the Board

The Board notes that many of the concerns expressed by Participants relate to Enbridge's emergency preparedness and response plan. The Board is satisfied that the measures proposed by Enbridge, including its commitments, to address emergency preparedness and response are appropriate. The Board is satisfied with Enbridge's reply to AMC, in particular, its reply to Mr. Kruk's report, and acknowledges the commitments made by Enbridge to the Government of Manitoba.

The Board recognizes the importance of, and expects Enbridge to ensure effective emergency management, including planning, training, communication and coordination with first responders, stakeholders and Aboriginal groups. Should the Project be approved, the Board reminds Enbridge that it must submit updates related to the Line 3 Replacement Pipeline to its Emergency Procedures Manual as required by section 32 of the OPR.

The Board imposes the following conditions requiring Enbridge to:

- submit an Emergency Response Plan specific to the Line 3 Replacement Pipeline that will be implemented during construction **(Certificate Condition 9** and **Section 58 Order Condition 9)**; and
- conduct one full-scale and two table-top emergency response exercises within 18 months from commencing operations **(Certificate Condition 35)**.

The Board expects emergency management-related discussions between Enbridge, first responders, stakeholders and Aboriginal groups to continue as part of Enbridge's existing

Public Awareness Program. This shall include planning and engagement activities for the operations phase of the Line 3 Replacement Pipeline, as required by the OPR. The Board notes the concerns raised by the Government of Manitoba and has required Enbridge to invite a representative from each province (that is, Alberta, Saskatchewan and Manitoba) to participate in or observe the exercises conducted pursuant to **Certificate Condition 35**.

3.2.2 Safety and Security

The OPR requires companies to take various measures to ensure the safety of employees or workers, contractors, the public and the environment during pipeline construction, including developing a construction safety manual and submitting it to the Board. Section 47 of the OPR requires a company to develop, implement and maintain a safety management program that anticipates, prevents, manages and mitigates potentially dangerous conditions and exposure to those conditions during all activities relating to construction, operation, maintenance, abandonment and emergency situations. Safety culture is developed and promoted in concert with an effectively implemented management system; it is expected that Enbridge will build and sustain a positive safety culture in order to proactively identify hazards, manage risk, and prevent incidents.

In accordance with the OPR, regulated companies are required to implement mitigative and preventative measures for all risks posed by hazards and threats to the integrity of pipeline systems, the public and workers, and to the environment. Specifically, section 47.1 of the OPR requires a company to develop, implement and maintain a security management program that anticipates, prevents, manages and mitigates conditions that could adversely affect people, property or the environment. Paragraph 4(1)(e) of the OPR further indicates that pipelines must be designed, constructed, operated or abandoned in accordance with the applicable provisions of CSA Z246.1: Security management for petroleum and natural gas industry systems.

Views of Enbridge

In its Application, Enbridge submitted that contractors will be required to adhere to all applicable safety regulations, and their own corporate safety manuals. Contractors will also be required to follow the most current edition of the Enbridge Contractor Safety Manual, which is currently on file with the NEB. Enbridge indicated safety inspectors will be on site during construction to ensure that all personnel follow safety procedures.

Enbridge also submitted that security management for the Project will be incorporated into the existing Liquids Product Security Management Program and assessment process used for all Enbridge pipeline systems and facilities. The security management program includes:

- security policies and procedures manuals;
- regional security response plans;
- security vulnerability assessments;
- threat monitoring and analysis;
- physical security measures;

- monitoring, tracking and trending of security incidents; and
- training and support of operation personnel.

Enbridge further stated that physical security measures used at facilities include: perimeter fencing, intrusion alarms, surveillance systems and lighting, all of which are documented in the Liquids Pipelines (LP) Security Management Program and the Regional Security Management Program.

Enbridge will manage any security issues identified during construction under its existing security management program and will involve the LP Security Coordinator and the Regional Emergency Response and Security Coordinator.

Enbridge submitted that it will complete a Project security risk assessment prior to construction activity and that its Enterprise Security group will develop a Project specific security plan, which will incorporate Enbridge's security policies and procedures for construction projects. When placed into operation, the security for the Line 3 Replacement Pipeline and related facilities will be in compliance with Enbridge's Security Management Program.

Views of Participants

The Rural Municipality of Stanley submitted that Enbridge has proven to operate safely within its area; the municipality has no concerns with safety and security during construction and operation of the Project.

Views of the Board

In the Board's view, public safety is paramount in the design, construction and operation of the Line 3 Replacement Pipeline. While the Board finds that a pipeline such as the Line 3 Replacement Pipeline can be built and operated safely, the Board acknowledges that risk cannot be completely eliminated. The Board is satisfied with the evidence submitted by Enbridge with respect to safety and security. In the Board's view, the measures proposed by Enbridge to address safety and security are appropriate.

However, to facilitate the ongoing review by the Board of Enbridge's safety plans and performance, the Board imposes conditions requiring Enbridge to file the following manual and reports:

- Construction Safety Manuals (Project-specific Safety Plans) for the Line 3 Replacement Pipeline **(Certificate Condition 13** and **Section 58 Order Condition 12)**; and
- Bi-monthly construction progress reports **(Certificate Condition 27** and **Section 58 Order Condition 19)** that include information on environmental, socio-economic, safety and security issues and issues of non-compliance; and the measures undertaken for the resolution of each issue and non-compliance.

In addition, and to facilitate the ongoing review by the Board of Enbridge's security plans and performance, the Board imposes a condition requiring Enbridge to confirm that it has developed a Security Management Program Plan for construction of the Line 3 Replacement Pipeline and that it has amended its corporate Security Management Program to include operation of the Line 3 Replacement Pipeline **(Certificate Condition 5** and **Section 58 Order Condition 5)**.

3.3 Land Matters

The Board's Filing Manual sets out the Board's expectations for lands information to support an application for a Certificate under section 52 and for an Order under section 58 of the NEB Act. Applicants are expected to provide a description and rationale for the proposed route of the pipeline, the location of associated facilities, and the permanent and temporary lands required for the Project. Applicants are also expected to provide a description of the land rights to be acquired and the land acquisition process, including the status of land acquisition activities.

3.3.1 Route Selection

The approximate total length of the Line 3 Replacement Pipeline route is 1,096 km of which 101 km are in Alberta, 689 km are in Saskatchewan, and 306 km are in Manitoba.

Enbridge submitted that the existing Enbridge mainline corridor and the Alberta Clipper Expansion Project (Alberta Clipper) alignment were chosen as the preferred alignment for almost the entire length of the Line 3 Replacement Pipeline for the following reasons:

- the existing mainline corridor has been in-service for over 50 years;
- adequate workspace is generally available along the route;
- environmental, socio-economic or land use constraints are generally not encountered along the route that cannot be effectively mitigated or compensated;
- effects associated with widening an existing pipeline corridor would be incremental, while a new route would affect additional lands and increase the amount of land disturbance; and
- pipeline surveillance and maintenance activities can be conducted more efficiently for pipelines located within a common RoW than for two rights-of-way (RoW) that are geographically separated.

Enbridge stated that Alberta Clipper deviates at several locations from the Enbridge mainline corridor to avoid urban areas, locations with limited workspace and steep, unstable slopes. An alignment along Alberta Clipper was generally chosen in these areas to avoid the routing constraints encountered by the mainline corridor.

Enbridge stated that by paralleling existing pipeline rights-of-way for most of the length of the Line 3 Replacement Pipeline route, Enbridge has reduced the amount of permanent easement needed and can use existing rights-of-way for temporary workspace.

New pump stations, associated facilities, tanks, interconnection work as well as RSVs will be needed for the Project. Enbridge stated that in the siting of permanent facilities it considered minimizing the amount of new disturbance, as well as optimizing maintenance activities and using its existing infrastructure.

Enbridge submitted that the Line 3 Replacement Pipeline route deviates from existing Enbridge rights-of-way and Alberta Clipper around the City of Morden to reduce the potential for conflicts with the city and associated urban land use to a much greater extent near Morden, Manitoba.

On 7 May 2015, in its Application update Enbridge stated that as a result of further public consultation and detailed engineering analysis, it identified 60 locations along the Line 3 Replacement Pipeline RoW where minor reroutes are required.

In its Application update dated 4 September 2015, Enbridge stated that it has identified an additional 19 locations along the Line 3 Replacement Pipeline RoW where minor route adjustments are required.

Enbridge submitted that with the proposed reroutes, the Line 3 Replacement Pipeline route will parallel the Alberta Clipper RoW for approximately 912 km (83% of the total length), and existing linear rights-of-way or disturbances for approximately 968 km (88% of the total length).

Enbridge confirmed that the route adjustments will not alter the conclusion of significance as presented in its Environmental and Socio-Economic Assessment (ESA). In addition, Enbridge submitted that it has executed easement agreements with landowners and there are no outstanding concerns for all proposed Line 3 Replacement Pipeline route adjustments.

Enbridge indicated that it has re-evaluated RSV locations and revised them to ensure optimal valve placement along the Line 3 Replacement Pipeline route.

Views of Participants

Mr. Stewart Crone, the landowner residing on the south half of 21-42-9- W4M, indicated that his land is the closest privately owned land to the Hardisty tank farm complex. Mr. Crone indicated that Enbridge has re-routed the Line 3 Replacement Pipeline in order to avoid crossing his other property located at SW-15-42-9-W4M. Mr. Crone expressed concerns that the re-route creates approximately three miles of new RoW, which increases the environmental footprint. Mr. Crone requested the Board order Enbridge to route the Line 3 Replacement Pipeline on to his lands.

Reply of Enbridge

Enbridge indicated that it re-routed the Line 3 Replacement Pipeline around Mr. Crone's property, because it was not able to enter into an agreement with Mr. Crone that would be satisfactory for both parties. Enbridge submitted that there are no significant adverse environmental effects as a result of the re-route.

Views of the Board

In the Board's view, the proposed route for the Line 3 Replacement Pipeline is acceptable. The Board finds that constructing the majority of the Line 3 Replacement Pipeline alongside and contiguous to the existing linear RoW is reasonable in the circumstances. With respect to Mr. Crone's property, the Board is not persuaded that Mr. Crone's suggested route is preferable to Enbridge's proposed route. The Board notes that routing decisions involve the consideration of many factors, including consultation with landowners. Mr. Crone's routing concerns are also referred to in Section 7.4.3.3 of this Report.

3.3.2 Land Requirements

Views of Enbridge

Enbridge submitted that the Project traverses 2008 tracts of land, representing 1,098 landowners and 307 occupants on Crown and privately-owned lands. A small amount of land has been acquired in fee simple for the two proposed new pump stations (5.4 ha and 2.2 ha), which are both located in Saskatchewan.

Enbridge submitted that the Project footprint for the Line 3 Replacement Pipeline will typically be 45 m in width and will be comprised of permanent easement and temporary workspace.

Enbridge indicated that permanent easement will typically be 12 m wide, with an additional 33 m of temporary workspace, which is required to facilitate safe and efficient construction of the Line 3 Replacement Pipeline. Temporary workspace and permanent easement widths may vary slightly depending upon where the existing pipelines are located within the adjacent rights-of-way. Additional temporary work space may also be required to facilitate construction.

Enbridge noted that additional land rights may also be required on a temporary basis for the Line 3 Replacement Pipeline construction needs such as stockpile sites, shoo-flies, temporary work camps and contractor staging areas as required. The specific requirements for such land rights will be identified as construction planning and detailed engineering and design progresses. Enbridge submitted that should additional land be required under these circumstances, it will endeavor to acquire those rights through negotiation with the affected landowners.

Tank Terminal
Enbridge stated that in order to accommodate commercial and operational requirements, the Project will require up to three new tanks at the Hardisty Terminal that will occupy the area of approximately 11 ha. However, no new lands will be required.

Pump Station Sites
In its Application, Enbridge stated that the Project will require 18 pump stations, two of which will require a small amount of new fee simple land to be acquired.

In its Application updates, Enbridge submitted that, through its ongoing Project planning, it identified some changes to the locations and layouts of the proposed pump stations, including the addition of two new pump stations (West Milden Station and Richardson Station), as substitutes for originally proposed works and expansion at the existing Milden and Rowatt pump stations.

Remote Sectionalizing Valve Sites (RSV)
Enbridge stated that the Project's RSV sites will be located within the permanent easement obtained for the Line 3 Replacement Pipeline, with additional temporary workspace potentially required to facilitate construction. Enbridge will determine the final locations of each RSV site based on a field assessment.

Permanent Access Roads
Enbridge stated that the Project will require permanent roads to access some of the RSV locations and the proposed West Milden Station and the Richardson Station. Enbridge confirmed that the total area in hectares required for new permanent access roads is 4.33 hectares.

Meter Stations
Enbridge indicated that new meter stations will be located within existing facilities and no additional land will be required.

Views of the Board

The Board finds the anticipated temporary and permanent land requirements to be reasonable and justified.

3.3.3 Land Acquisition Process

Views of Enbridge

Enbridge submitted that as of 1 May 2015, it had acquired approximately 98% of the land required for the Project. Enbridge submitted that it would continue to engage with the remainder of the affected landowners with the intent of resolving remaining concerns and issues where practicable, including those landowners who are affected by the proposed re-routes and new pump stations.

Enbridge stated that land acquisition for the Project has and will continue to comply with NEB requirements, including sections 86 and 87 of the NEB Act.

Enbridge confirmed that it has completed the service of all subsection 87(1) NEB Act notices to directly affected landowners along the proposed route of the Project.

Enbridge submitted that along with section 87 notices, landowners received a copy of the Board publication titled "Pipeline Regulation in Canada: A Guide for Landowners and the Public".

Views of the Board

The Board finds the land rights documentation and acquisition process proposed by Enbridge to be acceptable.

In the event a Certificate is issued for the Section 52 Pipeline and related Facilities, Enbridge will be required to prepare a plan, profile and book of reference (PPBoR) that depicts the proposed detailed route for the Section 52 Pipeline and related Facilities. With respect to the Section 58 Facilities, the Board grants Enbridge an exemption from paragraphs 31(c) and (d) and section 33 of the NEB Act, which refer to PPBoR-related requirements.

Chapter 4

Decommissioning of the Existing Line 3 Pipeline

The Board's List of Issues (Appendix I) states that the Board will consider as part of the hearing the suitability of the decommissioning plan for the Existing Line 3 Pipeline, including whether the decommissioning is appropriately an interim step to eventual abandonment or whether it is the final step in the pipeline's lifecycle. This chapter of the Report contains the Board's assessment of this issue.

An overview of Enbridge's decommissioning plan is provided below. Section 4.1 provides the Board's assessment of the appropriateness of decommissioning the Existing Line 3 Pipeline in-place versus pipeline removal. Sections 4.2 and 4.3 examine Enbridge's decommissioning plan from an engineering and environmental perspective, respectively. Lastly, Section 4.4 examines the issue of whether the decommissioning is appropriately an interim step to eventual abandonment or whether it is the final step in the Existing Line 3 Pipeline's lifecycle.

For the purpose of its assessment, the Board has considered the decommissioning of the Existing Line 3 Pipeline in two distinct phases: the Decommissioning Activities phase, in which treatment measures will be applied by Enbridge to decommission the Existing Line 3 Pipeline; and the Decommissioned Period phase, in which the Decommissioned Line 3 Pipeline would remain in-place.

The Board notes that in the Decommissioning Order Conditions (Appendix V), the term "Decommissioning Activities" is used more narrowly than it is in this Chapter. Specifically, implementation of buoyancy control measures is excluded from the definition of Decommissioning Activities in the Decommissioning Order Conditions so as to ensure clarity of the Board's conditions.

Overview of Enbridge's Decommissioning Plan

Enbridge proposes to decommission the Existing Line 3 Pipeline in-place. Enbridge noted that the potential long-term issues associated with decommissioning in-place have been outlined in several studies regarding pipeline decommissioning or abandonment. These include the Canadian Energy Pipelines Association (2007 CEPA Report)[2] and the Pipeline Abandonment Steering Committee (1996 Abandonment Discussion Paper)[3], as well as a report prepared by Det Norske Veritas for the NEB (2010 DNV Pipeline Abandonment Scoping Study).[4] These long-term issues include public safety, land use, ground subsidence, erosion and slope stability, the potential for the creation of water conduits, soil and groundwater contamination, pipe cleanliness, and watercourse crossings.

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[2] Canadian Energy Pipeline Association, 2007: Pipeline Abandonment Assumptions – Technical and Environmental Considerations for Development of Pipeline Abandonment Strategies.

[3] Pipeline Abandonment Steering Committee, 1996: Pipeline Abandonment – A Discussion Paper on Technical and Environmental Issues.

[4] Det Norske Veritas, 2010: Pipeline Abandonment Scoping Study.

In considering those issues, Enbridge conducted three levels of decommissioning treatment assessments to determine where additional measures would be warranted to mitigate the potential effects of decommissioning a pipeline in-place. These included an engineering assessment to determine site-specific engineering requirements; a land use assessment to determine potential impacts to future developments at select locations; and an environmental evaluation to review environmentally sensitive areas and determine where additional site-specific measures, including segmentation, are warranted to reduce the magnitude of the potential effects of the Decommissioned Line 3 Pipeline to those features. Enbridge's assessment considered the following to be environmentally sensitive areas: municipal areas and community water supplies; known contamination in the Project area; watercourse crossings, wetlands and connected drainages; areas with steep slopes potentially susceptible to erosion or slope instability; species at risk and critical habitat; and other areas (for example, areas with saline and/or sodic soils, provincial and federal parks). Enbridge noted that ultimately, assessment and monitoring, or segmentation, was prescribed for all at-risk resources.

Based on the results of its assessments, Enbridge determined that decommissioning of the Existing Line 3 Pipeline would consist of fluids displacement, cleaning, isolation and segmentation. Enbridge stated that the Decommissioned Line 3 Pipeline would be left in-place within Enbridge's mainline corridor and be subject to continued monitoring.

Enbridge indicated that it expects to further update its decommissioning strategy and plan based on detailed engineering, its integrity program, post-construction monitoring of the Line 3 Replacement Pipeline and other Enbridge pipelines within the mainline corridor, mitigation of identified contaminated sites adjoining the Existing Line 3 Pipeline, and stakeholder consultation. On 20 May 2015, Enbridge filed an updated Decommissioning Environmental Technical Report that incorporated additional work that Enbridge had completed with respect to decommissioning since filing its Application.

4.1 Decommissioning In-Place Versus Pipeline Removal

Views of Enbridge

As part of the Project, Enbridge is proposing to decommission the following segments of the Existing Line 3 Pipeline, totaling approximately 1,067 km:

- Hardisty Terminal (E1/2 19-42-9 W4M) to Cromer Terminal (NE 17-9-28 WPM and SE 20-9-28 WPM); and
- NW 9-9-26 WPM to Gretna Station (SE 8-1-1 WPM).

In determining its proposed method of decommissioning the Existing Line 3 Pipeline, Enbridge referred to the 2007 CEPA Report and the 1996 Abandonment Discussion paper, which state that current and future land use are key factors that must be considered in determining whether a pipeline, or section of pipeline, should be left in-place or removed. Enbridge indicated that it used CEPA's Abandonment Matrix for guidance purposes in the preliminary stages of decommissioning planning since, from a physical perspective, decommissioning a pipeline in-place is comparable to abandonment in-place.

Enbridge submitted that land use assessment is a key component of pipeline decommissioning planning, particularly for determining areas vulnerable to land disturbance, such as native prairie, parks and ecological reserves, unstable or highly erodible slopes and irrigated land. Enbridge noted that CEPA recognizes that pipelines abandoned in-place may present a potential hindrance to ongoing land management, by providing constraints to future construction (for example, by causing a physical obstruction to future excavations, pilings, underground utilities or additional pipelines and future projects) or areas with special depth of cover concerns. However, Enbridge indicated that adverse impacts to land use may also occur as a result of the ground disturbance associated with removing the pipeline, particularly in areas under cultivation with special features where existing infrastructure may be affected.

Enbridge stated that CEPA's Abandonment Matrix recommends pipeline abandonment based on the diameter of pipeline, and existing and potential future land use considerations. In its Application, Enbridge provided a summary of the CEPA matrix, as it relates to large diameter pipelines such as the Existing Line 3 Pipeline (see Table 4-1). For large diameter pipes (greater than 660 mm or 26 inches), the abandonment methods recommended by CEPA are broken into ten land-use categories and include abandon in-place, abandon in-place with special treatment, and pipeline removal. Enbridge indicated that CEPA recommends that a risk-based, comprehensive site-specific assessment be conducted to validate the above-noted abandonment strategies.

Table 4-1 - CEPA Pipeline Abandonment Matrix for Large Diameter Pipelines (as adapted by Enbridge in its Application)

Land Use		Primary Option for Abandonment Pipe Diameter > 660 mm (> 26 in)
Agricultural	Cultivated	Abandon in-place
	Cultivated with special features (depth of cover considerations)	Removal
	Non-Cultivated (native prairie, rangeland, pasture)	Abandon in-place
Non-Agricultural	Existing Developed Lands (commercial, industrial, residential)	Abandon in-place
	Prospective Future Development (commercial, industrial, residential)	Removal
	No Future Development (e.g., forest areas)	Abandon in-place
Other Areas	Environmentally Sensitive Areas (including wetlands)	Abandon in-place
	Roads and Railways	Abandon in-place with special treatments to prevent potential ground subsidence (for example, fill the pipe with concrete)
	Water Crossings	Abandon in-place
	Other Crossings (Utilities)	Abandon in-place with special treatments to prevent potential ground subsidence (for example, fill the pipe with concrete)

Enbridge indicated that in CEPA's Abandonment Matrix, removal is the preferred abandonment option only in limited circumstances such as: specific cultivated locations where depth of cover is a special concern (for example, tree farms and deep-tilling operations), or where there is the potential for future development. Enbridge further noted that in areas of future land development, CEPA states the preferred option is to abandon the pipeline in-place until the land is developed to lessen the overall impact to the area.

Enbridge submitted that it proposes to decommission the Existing Line 3 Pipeline in-place for all land use categories, based on a risk-based approach. Enbridge indicated this strategy aligns with CEPA guidance, which states that a risk-based assessment may provide justification to validate or override the primary options recommended in CEPA's Abandonment Matrix, and there may be specific risk-based decisions or legal considerations, which may change the preferred abandonment option.

Enbridge stated that its assessment found that the risks associated with removing the Existing Line 3 Pipeline outweigh the risks associated with leaving it in-place, based on current and anticipated land use. Enbridge noted that the Existing Line 3 Pipeline is located within Enbridge's mainline corridor with up to six other operating pipelines, and the distance between the adjacent active pipelines is generally three metres centre to centre. Enbridge provided a schematic showing the relative position of the Existing Line 3 Pipeline within the corridor (See Figure 4-1 at the end of this Chapter).

Enbridge noted that there are many public and worker safety concerns, as well as environmental risks, associated with removing a pipeline. Enbridge stated that removal would cause threats to existing adjacent infrastructure, which could lead to significant public, environment and operational issues. It argued that, despite robust construction specifications, the likelihood of damage to existing infrastructure as result of line strikes, lateral movement and increased stress during removal to Enbridge's other adjacent, operating pipelines and to third-party utilities crossed by the Existing Line 3 Pipeline would be significant.

Enbridge stated that the environmental hazards associated with pipe removal are related to the disturbance of soil and groundwater, potential impacts to wildlife and vegetation, and the chance of a release caused by a line strike during construction activities. As well, it indicated that soil stability during and after excavation could lead to increased localized erosion and destabilized slopes. Enbridge stated that these hazards may cause considerable disruption to ongoing and future land management activities, and the risk of these occurrences increases significantly with the scale of the project.

In Enbridge's view, the Existing Line 3 Pipeline can be safely decommissioned in-place with special treatment and monitoring to ensure public safety and environmental protection. By leaving the Existing Line 3 Pipeline in-place, stakeholder, environmental and community disturbance would be reduced. Specifically, Enbridge expected fewer overall impacts to environmentally sensitive areas (for example, wetlands, parks, species at risk habitats), water crossings with important fisheries, forested lands, developed areas, non-cultivated lands (for example, native prairie, rangeland), road and rail crossings, and cultivated areas.

Enbridge submitted that its commitments to ongoing monitoring would adequately address any risks associated with the Decommissioned Line 3 Pipeline hindering ongoing land management. Enbridge noted that the Decommissioned Line 3 Pipeline RoW would not be available for most alternate land uses or future development due to safety concerns associated with working on, between or adjacent to the other operating pipelines in the corridor. Enbridge stated that any proposed future developments would be evaluated, as they arise in negotiations with the developer, and would consider implications to the overall pipeline corridor and not just the Existing Line 3 Pipeline in isolation. While Enbridge indicated that it did not anticipate any

conflicts arising, it was of the view that any mitigation measures necessary would be implemented on a case-by-case basis to prevent any environmental impacts and to ensure the safety of landowners and the general public.

With respect to land matters concerning Enbridge's proposed approach to decommissioning, Enbridge submitted that the Existing Line 3 Pipeline encompasses 2,324 tracts of land which, for the most part, parallel Enbridge's mainline corridor and the Line 3 Replacement Pipeline. Most directly affected landowners are impacted by both the decommissioning of the Existing Line 3 Pipeline and the Line 3 Replacement Pipeline. However, Enbridge indicated that there are a few locations where landowners are only affected by the decommissioning of the Existing Line 3 Pipeline. Enbridge submitted that 328 tracts of land (approximately 180 landowners) are solely affected by the decommissioning aspect of the Project.

Enbridge stated that of the 1,341 landowners affected by the decommissioning, 1,338 have either signed decommissioning agreements or have otherwise indicated that they have no outstanding concerns about the method of decommissioning.

Enbridge stated that it will not be surrendering its rights under the easements agreements for the Decommissioned Line 3 Pipeline, since maintaining the easement allows Enbridge to meet its commitments to landowners in relation to the Decommissioned Line 3 Pipeline in perpetuity.

Enbridge confirmed that it was able to resolve outstanding concerns of CAEPLA/SAPL/MPLA regarding the decommissioning of the Existing Line 3 Pipeline, as the parties signed a settlement agreement dated 5 June 2015 (Decommissioning Settlement Agreement). The Decommissioning Settlement Agreement addresses numerous decommissioning procedures, such as depth of cover monitoring, restoration of subsidence, remediation of contamination, and an integrity dig process. The Decommissioning Settlement Agreement provides specific details to landowners regarding surface disturbances associated with decommissioning activities. Pursuant to the Decommissioning Settlement Agreement, Enbridge agreed to fund independent, third-party research to study the impacts of decommissioning and abandoning pipelines in-place and to file the related final report with the Board. The Decommissioning Settlement Agreement states that, "[t]he commitments in the Agreement are intended to foster positive, long-term relationships with affected landowners in respect of the Line 3 pipeline decommissioning plan" as set out in Enbridge's Application. Furthermore, Enbridge submitted that the mitigations set out in the Decommissioning Settlement Agreement will apply to all landowners affected by the decommissioning of the Existing Line 3 Pipeline.

Views of Participants

Mr. Stewart Crone stated that he owns lands crossed by the Existing Line 3 Pipeline in SW/SE 21-42-9 W4M, and that on his lands the Existing Line 3 Pipeline is in a corridor with four other operating pipelines owned by Enbridge. Mr. Crone requested that the Existing Line 3 Pipeline be removed from his lands since his lands are located close to the Hardisty tank farm complex, which makes them desirable to industry. In his view, the pipelines located on his lands are a detriment to future land use and have restricted his ability to sell the land. Mr. Crone submitted that Enbridge advised him that it was too expensive to remove the Existing Line 3 Pipeline. Mr. Crone submitted that Enbridge should not have the right to indefinitely tie up use of his property

by leaving the Existing Line 3 Pipeline in-place, nor should he have to bear the reduction in the value of his lands as a result of the pipeline remaining in-place.

The Manitoba Metis Federation (MMF) indicated that it has outstanding questions about whether the best option is to leave the pipeline in-place, or remove it completely and remediate the RoW. It noted that some of its members expressed a preference for pipeline removal, in order to avoid environmental impacts.

Moosomin First Nation (Moosomin) and Kahkewistahaw First Nation (Kahkewistahaw) noted Enbridge's diligent use of in-place decommissioning methods, but urged Enbridge, when researching in-place impacts and evaluating preferred abandonment strategies, to expand the use of CEPA land use research categories to include traditional, cultural and heritage values. They stated that their elders' cultural heritage and traditional knowledge could assist Enbridge in improving these category strategies.

Ochapowace Nation (Ochapowace) stated that it would like Enbridge to put forth a specific decommissioning plan for their lands near the Pilot Butte area of Saskatchewan, which takes into account that Ochapowace has other future uses to its land once the corridor has been taken out of service.

Keeseekoose noted that a portion of the Existing Line 3 Pipeline currently traverses through its lands south of Regina. Similar to Ochapowace, Keeseekoose requested that Enbridge put forth a specific decommissioning plan for this area, which takes into account that Keeseekoose may have other future uses for its land area, including residential and commercial development and continued use of the land to practice its traditional cultural law and ceremonies, once the corridor has been taken out of service.

CAEPLA/MPLA/SAPL advised that, pursuant to the Decommissioning Settlement Agreement, it has resolved its concerns with Enbridge and its landowners support Enbridge's Application for the Project.

Reply of Enbridge

In response to Ochapowace's concerns, Enbridge stated that the Existing Line 3 Pipeline does not traverse Ochapowace's Reserve lands, but rather the pipeline runs through a corridor that is titled to Enbridge in fee simple, and is bounded by Ochapowace's Reserve lands on both sides. Enbridge submitted that it has proposed a decommissioning plan for the entire length of the Existing Line 3 Pipeline, which will apply to the portion of the pipeline in this area.

Regarding Keeseekoose's submission that Enbridge should prepare a specific decommissioning plan, coupled with its concerns related to past contamination along the Existing Line 3 Pipeline RoW, Enbridge stated that Keeseekoose's lands are not crossed by the Existing Line 3 Pipeline. Enbridge noted the route of the Alberta Clipper pipeline is in close proximity to Keeseekoose's parcels of lands, but stated the listed parcels are not directly affected by the Existing Line 3 Pipeline. Enbridge submitted that it has proposed a decommissioning plan for the entire length of the Existing Line 3 Pipeline, which would include that part of the pipeline that is closest to Keeseekoose's lands.

Views of the Board

In assessing Enbridge's proposal to decommission the Existing Line 3 Pipeline in-place, the Board considered the views of all hearing participants. In this case, the Board received a limited number of submissions requesting that the Existing Line 3 Pipeline be removed from the ground.

The Board considered the totality of the evidence to determine the appropriateness of decommissioning the Existing Line 3 Pipeline in-place versus removing it either fully or partially. The Board did not make any assumptions that one option was preferable to the other, but rather looked at the circumstances affecting the Existing Line 3 Pipeline at this time.

There was very little landowner involvement in the hearing process. This appears largely due to Enbridge's efforts to resolve landowner concerns, including its ability to negotiate the Decommissioning Settlement Agreement with CAEPLA/MPLA/SAPL. The Board views this Agreement as a positive initiative and found it to be a persuasive factor in favour of the reasonableness of Enbridge's decommissioning plan. In addition, the Board notes that the mitigations set out by Enbridge pursuant to the Decommissioning Settlement Agreement will be applied to all landowners affected by the decommissioning of the Existing Line 3 Pipeline.

Concerning the effects of the Existing Line 3 Pipeline to future land use, the Board is of the view that Enbridge's commitment to re-evaluate future land use issues, as they arise during the Decommissioned Period, is appropriate given that the Decommissioned Line 3 Pipeline RoW would not be immediately available for most alternate land uses or future development until the adjacent pipelines cease operation. As part of its commitment to re-evaluate future land use issues as they arise, the Board expects Enbridge to consider traditional, cultural and heritage values. The Board also encourages the expansion of the CEPA land use categories to include these considerations.

The Board expects Enbridge to continue to consult with affected Aboriginal groups and landowners during Decommissioning Activities and the Decommissioned Period and periodically re-assess the constraints and hazards that limit pipeline removal to arrive at a solution that is agreeable to all parties, based on the site-specific circumstances. The Board imposes **Decommissioning Order Conditions 7-9, 13-15 and 19**. The Board is satisfied that the inclusion of these conditions, among others, will provide mechanisms by which Enbridge and affected Aboriginal groups and landowners will be able to address outstanding questions and concerns.

The Board is satisfied that, subject to a number of conditions it is imposing, Enbridge's plan for decommissioning the Existing Line 3 Pipeline in-place is appropriate in the current circumstances. The Existing Line 3 Pipeline is in a corridor containing up to six pipelines in close proximity to one another. The Board considered Enbridge's evidence related to the safety and environmental risks associated with excavating and removing pipeline from the ground, including the possibility of damage or ruptures to the adjacent active pipelines and resulting environmental damage. There was insufficient evidence to

persuade the Board that there are benefits to removing the Existing Line 3 Pipeline that outweigh the risks at this time.

However, this is not to say that the Board will not order pipeline removal in a future case, should the evidence support it. It also does not mean that the Board will not order removal of the Decommissioned Line 3 Pipeline in the future if circumstances change. This may occur in cases where the benefits of removing certain segments of the Existing Line 3 Pipeline outweigh the risks of the pipeline remaining in-place.

4.2 Engineering Matters

4.2.1 Decommissioning Activities

Views of Enbridge

Enbridge Engineering Decommissioning Design Principles
Enbridge submitted that the decommissioning of the Existing Line 3 Pipeline will be designed, implemented, and monitored in accordance with CSA Z662, OPR, the NEB Filing Manual Guide B, Enbridge specifications, standards and procedures, and other applicable industry codes and standards. Enbridge advised that all other Project specific commitments it made for the decommissioning of the Existing Line 3 Pipeline, including commitments made to the Board in Enbridge's Application, landowner agreements, and third party crossing agreements, will be incorporated into its the design, execution, and ongoing monitoring.

Displacement and Cleaning Activities
Enbridge stated that as part of the decommissioning of the Existing Line 3 Pipeline, the product will be displaced and the pipeline will be cleaned to reduce residual hydrocarbon deposits to the extent practical. Enbridge submitted that it will execute its displacement and cleaning activities by way of four separate pipeline sections from Hardisty, Alberta to Gretna, Manitoba. Enbridge stated there are two potential approaches to execute the displacement and cleaning program. They are: combine the displacement and cleaning programs into one operation; or separate the displacement and cleaning programs into two operations.

Enbridge submitted that the product within the Existing Line 3 Pipeline will be removed by a pig designed for product displacement. The pig selection will be based on the characteristics of the final product shipped on the Existing Line 3 Pipeline. The planned displacement/cleaning program will be performed using cleaning fluid stages between pigs either immediately following the displacement pig or as a separate train.

Enbridge stated that assuming a conservative residual product film thickness of 25.4 micron (1 mil), the displacement of the product is expected to remove 99.988% of the product from the pipeline; this remaining residual product is further reduced by the cleaning program.

Enbridge submitted that it conducted a cleaning validation program on a 19.8 km section of the NPS 34 Line 3 pipeline that was recently deactivated near Cromer, Manitoba, as part of NEB Order XO-E101-016-2013. The cleaning program consisted of one chemical train (comprised of two 18 m^3 batches of cleaning solution and one 35 m^3 water batch), one rinse train (comprised of three 35 m^3 water batches), and a third train (comprised of a foam pig and scraper pig) to remove

residual bulk fluid remaining in the pipeline. Approximately 5 m^3 of cleaning solution was injected in front of the chemical train to lubricate the first pig in the train. A combination of hard brushes, pencil brushes, and scraper pigs were used to scrape the pipe walls and maximize cleaning effectiveness.

Enbridge stated it completed its engineering of the cleaning validation program in two phases: laboratory testing of representative pipeline material to determine appropriate chemical selection for the cleaning solution and hydraulic modeling and design of the cleaning train. Laboratory testing of potential cleaning chemistries was completed. These tests determined that a water-based cleaning formulation, in combination with water rinses, was most appropriate for cleaning the Line 3 pipeline segment. The volume of cleaning solution and water were sized based on specific parameters of the pipeline segment (those are, length and diameter). Engineering of the Existing Line 3 Pipeline cleaning program will consist of the same two phase approach, during which the batch sizes and cleaning chemistry may be subject to change.

Enbridge stated that the execution of the cleaning operation was split into three separate trains due to the size of receiving traps available for the cleaning validation program. An Enbridge contractor agreed that the resulting cleanliness for either a combined or split pig train would not change provided the fluid volumes, cleaning fluids, and fluid residence times are not altered. Enbridge submitted it intends to clean the Existing Line 3 Pipeline in a single operation (one pig train).

Enbridge stated that it used Nitrogen to propel all pig trains, since its inert properties allow for the safe propulsion of the cleaning train regardless of the residual vapours. The propellant selection for the Existing Line 3 Pipeline cleaning program will be further evaluated as part of detailed engineering.

Based on the successful execution of the cleaning validation program, Enbridge submitted that it will implement the same engineering approach it used for the cleaning validation program to develop the cleaning program for the Existing Line 3 Pipeline.

Enbridge stated the displacement program will be finalized during detailed engineering.

Pipeline Isolation

Enbridge stated that as per CSA Z662, the Existing Line 3 Pipeline will be physically separated from in-service piping to prevent the reintroduction of product into the Decommissioned Line 3 Pipeline. Additionally, Enbridge will de-electrify equipment and instrumentation on the Existing Line 3 Pipeline for safety reasons.

Enbridge submitted the pressure-containing side of any isolation location (as applicable) will be designed and installed according to all applicable industry and Enbridge standards. Facilities will be isolated from the Existing Line 3 Pipeline in accordance with the details below.

Pump Stations and Terminals

Pump station and terminal isolation will be achieved by physically cutting the Existing Line 3 Pipeline, removing a short piece of pipe, and welding a plate to the pipe on each side of the removed pipe. This activity will occur both upstream of the station suction valve and downstream of the station discharge valve. It is anticipated that this activity will occur near the

fenced boundaries of the stations and terminals to ensure all auxiliary piping is isolated within the pump station or terminal. Enbridge will evaluate on a site-specific basis, the precise locations where these activities will occur to minimize disruption to any nearby infrastructure due to construction activities. The Hardisty Terminal will only be isolated on the downstream side of the terminal, and Gretna Station will only be isolated on the upstream sides of the facility, respectively, as they are the initiating and terminating facilities of the Project.

Crossovers

Enbridge submitted that for crossover piping, which interconnects operating pipelines, it will physically separate this piping by means of cut and plate, blind flange, or other means of physical separation, which will be determined on a site-specific basis during detailed engineering.

RSVs and MLBVs

Enbridge indicated RSVs and other mainline block valves (MLBVs) will be electrically isolated. In Enbridge's view, RSVs and MLBVs do not require physical separation from active piping associated with pipelines, other than the Existing Line 3 Pipeline, but they will be used for engineering segmentation.

Electrical and Instrumentation

Enbridge indicated that electrical connections will be de-energized and rendered safe as determined during detailed engineering. Any electrical or instrumentation infrastructure required for the ongoing application of the CP system will be maintained.

Stand-alone Above-Grade Facilities along the RoW

Enbridge indicated facilities (for example, RSVs/MLBVs, instrumentation shelters) that are not co-located with other facilities along the RoW will be removed to a depth of 1 m below surface grade or to the top of the valve body, whichever is less, and the RoW will be restored.

Enbridge indicated it will complete field investigations (that is, ground-truthing) during detailed engineering to confirm the configuration and locations of all facilities or pipelines requiring isolation.

Pipeline Segmentation

Enbridge submitted that the Existing Line 3 Pipeline will be segmented by installing a full containment plug at environmentally sensitive locations, and by closing, permanently disabling, and de-electrifying all valves along the Existing Line 3 Pipeline. Sites physically isolated by cut and plate will also provide a segmentation location even though their function will be to provide physical separation from active assets. Enbridge stated, at segmentation locations identified in its ESA, a plug will be installed by filling a section of the pipe with sufficient engineered fill to create an impermeable barrier to water flow. Enbridge submitted it is planning a minimal disturbance method for installing the plugs, whereby pneumatic or hydraulic excavation from the surface will uncover small sections of the pipeline sufficient in size to drill or cut into the pipe from the surface and allow for installation of the containment bulkheads.

Enbridge submitted it will conduct research and development and evaluate a minimally invasive procedure for segmentation of decommissioned pipelines in general. Enbridge indicated, upon

completion of this work, it will file a report with the NEB for review prior to implementation. Enbridge submitted, if the research and development program determines that the planned segmentation method is not viable, segmentation will be accomplished by conventional excavation, and cut and plate methods.

Locations for Decommissioning Activities
Enbridge identified the locations for planned Decommissioning Activities, including a listing of facility types, the estimated length, size or quantity for each facility, a description of the pipe or facility, and the facility locations along the Existing Line 3 Pipeline. Enbridge indicated the locations are approximate and will be confirmed during detailed engineering.

Slope Stability
Enbridge referred to the 2007 CEPA Report, specifically Section 3.7, which indicates that the preferred option for sections of the pipeline on a slope is decommissioning in-place, because over time, the pipeline may play a key role in reinforcing and stabilizing a slope. Enbridge submitted decommissioning in-place may, therefore, decrease environmental risk by minimizing or removing the need for protective measures (for example, berms, ditch plugs, sub-drains) that are required due to ground disturbance when a pipeline is removed rather than decommissioned in-place. Enbridge will review areas of slope instability and their current mitigation strategies during detailed engineering.

Slope stability and environmental risks of leaving the Decommissioned Line 3 Pipeline in-place are discussed further in Section 4.3.1.

Views of the Board

The Board is persuaded by the evidence submitted by Enbridge regarding decommissioning design principles and is satisfied with Enbridge's commitment to design, implement and monitor the Decommissioned Line 3 Pipeline in accordance with the regulations, industry codes, standards and guidelines referred to above. The Board is also satisfied that the various commitments made by Enbridge to the Board in its Application and to landowners, including those made in the Decommissioning Settlement Agreement, will be incorporated into the design, execution and ongoing monitoring of the Decommissioned Line 3 Pipeline.

The Board is persuaded that the results of the product displacement activities undertaken by Enbridge on an approximately 20 km section of NPS 34 Line 3 pipeline were successful and in accordance with applicable codes and standards. The Board is satisfied that the engineering methods used for cleaning that section of the Line 3 pipeline are appropriate for developing the cleaning program to decommission the Existing Line 3 Pipeline. However, in accordance with Enbridge's commitment, the Board reminds Enbridge to file its final displacement program with the Board prior to implementing it.

With respect to pipe isolation, the Board is satisfied with the evidence and plan submitted to date. The Board is of the view that the isolation techniques presented by Enbridge take into account applicable codes and standard industry practices, and that the steps taken should render the Decommissioned Line 3 Pipeline safe for the public. The Board

reminds Enbridge of its commitment to submit its final detailed engineering design to the Board.

The Board is persuaded that Enbridge has taken the appropriate steps to develop a minimally invasive procedure to implement pipe segmentation. In the event that the development of the minimally invasive technique is not viable, the Board is satisfied with Enbridge's mitigation plan, which is in accordance with applicable codes and standard industry practice.

The Board is satisfied with Enbridge's submission regarding Decommissioning Activities, but also recognizes that Enbridge still needs to do further studies around the site specific requirements of the Decommissioning Activities.

The Board is satisfied with Enbridge's assessment of slope stability in relation to pipelines being decommissioned in-place. The Board is persuaded that decommissioning a pipeline in-place may help to reinforce and stabilize a slope and, among other things, reduce risk to adjacent pipelines and environmental risk.

4.2.2 Corrosion, Structural Integrity and Subsidence

Views of Enbridge

Enbridge submitted that it has performed a thorough review of the possible risks associated with ground subsidence with respect to pipeline decommissioning, and that it has considered industry guidance and additional Enbridge work as submitted in its Application. As a result of its review, Enbridge identified the following potential consequences related to ground subsidence with respect to pipeline decommissioning.

Public Safety

- hazards to agricultural equipment;
- road subsidence at primary highways;
- track bed subsidence at railway crossings; and
- hazards to people, machinery, or livestock.

Environmental Impact and Land use

- water channeling and subsequent erosion;
- loss of topsoil; and
- long-term impact on land aesthetics.

Predicted External Corrosion Progression

Enbridge submitted that after decommissioning the Existing Line 3 Pipeline, external corrosion is expected to progress in a manner similar to that which has been historically observed. External corrosion is expected to grow at the locations of coating holidays, or disbonded coating. Pitting corrosion is expected to be the primary form of corrosion on the Decommissioned Line 3

Pipeline, as opposed to large scale general corrosion. The external corrosion is expected to continue being localized on the sides of the pipe, where the highest percentage of external metal loss has been measured. External corrosion is expected to be the dominate degradation rate until pits penetrate through wall, allowing moisture ingress into the pipeline.

Enbridge indicated once external perforations have developed, water or soil may accumulate within the Decommissioned Line 3 Pipeline, and internal corrosion may progress. This accumulation is expected to occur over hundreds of years.

In addition, Enbridge indicated that as the coating degrades and disbonds, more of the pipeline surface will be exposed. For areas where coating fails completely (that is, exposing the external surface of the pipe to the surrounding soil), these will now be accessible to the CP system, which would minimize subsequent corrosion growth. Enbridge submitted, by contrast, locations where the coating is disbonded but remains intact will be shielded from the CP system and subject to continued corrosion.

Predicted Internal Corrosion Progression

Enbridge submitted the predicted internal corrosion progression assumes the pipe has been cleaned, and residual moisture levels are as proposed in the cleaning program. Enbridge also assumed that corrosion due to microbially induced corrosion (MIC) is negligible. Enbridge indicated that based on the cleaning program, any residual moisture will not have sufficient volume to pool, and the pipeline will have low oxygen content as nitrogen may be used to drive the cleaning pigs. However, Enbridge considered the fact that there may be the possibility of residual moisture in areas of existing internal pits, undercuts, or other defects that are not sufficiently dried during cleaning. Therefore, given the lack of other specific data, Enbridge submitted it may consider that an internal corrosion rate of 0.05 mm/year be used to provide a conservative estimate of the internal corrosion rates prior to perforation of the pipe wall.

Enbridge submitted that when considering a partial fill scenario, when the pipe has perforated, the internal surface will be exposed to moisture and possibly soil. Enbridge submitted that small-scale testing of bare carrier pipe exposed to air and a static level of brackish water (1/2-filled annular space) showed an average corrosion rate of 0.22 mm/year and an average pitting rate of 0.45 mm/year. Enbridge noted that these rates were observed primarily at the water/air interface, which was located at the 3 o'clock and 9 o'clock positions in the experiment. Other locations around the pipe showed relatively low corrosion rates, with a maximum rate of 0.06 mm/year and no appreciable pitting.

Enbridge indicated that if soil were to enter the Decommissioned Line 3 Pipeline, there is the possibility these deposits could cause localized areas of corrosion, which would be expected to occur along the bottom of the pipe at or near the 6 o'clock position where the soil is likely to settle. For this scenario, the internal surface would essentially act analogous to a bare external surface. ANSI/NACE SP0502-2010 provides a default pitting rate of 0.3 mm/year for pipelines when other data are not available, provided the CP level of the piping has had at least 40 mV of polarization for a significant fraction of time since installation.

Structural Integrity and Subsidence

With respect to structural integrity and subsidence, Enbridge submitted the primary loads to consider acting on a decommissioned pipeline that may contribute to structural collapse are loads imposed by soil cover, and any surface loads transferred to the pipe from forces acting at the ground surface. Surface loads may refer to any loads acting at the ground surface, such as vehicular or equipment loads. Enbridge indicated the load acting directly at the pipe, or the "effective live load", is generally much less than the loads at the surface, as the loads are dissipated through the soil as they are transferred to the pipe. The degree of this dissipation is dependent on the depth of soil cover.

Enbridge stated the effects of surface live loads on a decommissioned pipeline are considered to be more significant than the loads associated with depth of cover alone. If the loads are sufficient enough to exceed the structural capacity of a decommissioned pipeline, the pressures transferred to the pipe will lead to ovalization. Enbridge explained if the loads are sufficient to progress, the pipe may fail through either plastic collapse or elastic buckling.

Subsidence Failure Modes

Enbridge submitted that ground subsidence can occur where a void is created within the ground, generally at the pipe depth, allowing the soil above to collapse into the void, and creating a disturbance at the surface. Enbridge indicated this may occur due to a combination of corrosion degradation, and loss of structural integrity of the pipe wall. Subsidence due to corrosion can be either partial, considering soil infill into large localized perforations in a decommissioned pipe, or total, considering significant overall general wall loss and total infill of soil. Enbridge advised structural integrity, in the case of a decommissioned pipeline, is defined by the ability of the pipeline to resist collapse due to external loading, rather than internal product and pressure containment. Det Norske Veritas (DNV GL), on behalf of Enbridge, recognized that an abandoned pipeline sufficiently degraded by corrosion such that structural integrity is compromised could, in theory, collapse due to the weight of the soil and any potential surface loads present.

Predicted Subsidence Profiles

Enbridge submitted the rate and magnitude of ground subsidence are generally difficult to predict. Subsidence depends on a complex combination of site-specific parameters, pipe degradation, and soil mechanics properties near the pipeline. Enbridge advised that ideally, ground subsidence estimations should consider both total subsidence from pipe collapse at shallow burial depth, and partial subsidence due to excessive ovalization and/or finite soil ingress.

In explaining that the width of the subsidence trough is predicted to be significantly greater than the depth, as seen in the settlement profiles, Enbridge provided an example. Based on the worst case subsidence profile for total subsidence of a 34 inch pipe, at 0.6 m depth of cover, Enbridge predicted the peak depth to be 17.25 cm (6.8 inches), whereas the full width of the profile spans nearly 8 m.

In addition, Enbridge stated the largest magnitude of subsidence, predicted for a 34 inch pipeline at a depth of cover 0.6 m was approximately 17.25 cm (6.8 inches), decreasing to 11.95 cm (4.7 inches) of subsidence at 2 m of cover, as shown in Table 4-2 below. This assumes a scenario where there is complete 100% soil infill of the pipe through either complete collapse of the pipe wall, or total degradation of the pipe steel.

Table 4-2- Settlement at 100% Volume Loss

Prediction with Assumed Volume Loss of 100%		
Depth of Cover(m)	Peak Subsidence (m)	Half width of significant settlement trough (m)
0.6	0.1725 (6.8")	1.36
1.2	0.1450 (5.7")	1.62
1.6	0.1310 (5.2")	1.79
2	0.1195 (4.7")	1.96
4	0.0831 (3.3")	2.82

Enbridge indicated that its 2008 depth of cover survey showed that less than 1% of the Existing Line 3 Pipeline has a depth of cover equal to or less than 0.9 m and over 50% of it has a depth of cover greater than 1.2 m. As a result, Enbridge expects that magnitude of any subsidence as a result of complete loss of pipe volume and 100% infill would be expected to be approximately 15 cm (or 6 inches) or less.

Views of the Board

The Board is of the view that Enbridge appropriately considered the risks associated with ground subsidence in designing its decommissioning plan. The Board is satisfied that Enbridge has identified the major potential issues that can be presented with a decommissioned pipeline, and expects Enbridge to continually evaluate these risks as it obtains more knowledge on the Decommissioned Line 3 Pipeline through its monitoring program.

The Board is satisfied that Enbridge has adequately considered the risks associated with external corrosion in designing its decommissioning plan. The Board is of the view that, as the natural state of any pipeline left in-place is to deteriorate over time, the continuation of the CP system on the Decommissioned Line 3 Pipeline will help to slow the progression of corrosion. This will potentially allow more time for Enbridge to implement its monitoring program and to detect and mitigate any major subsidence before it becomes a hazard.

The Board is satisfied Enbridge has considered and assessed the risks associated with internal corrosion in designing its decommissioning plan. The Board is also satisfied that Enbridge has completed studies on the internal corrosion rates in different scenarios. In the Board's view, due to unknown conditions and changing characteristics of the Existing

Line 3 Pipeline, it would be prudent for Enbridge to apply the most conservative corrosion rates when developing its estimates of structural integrity and life expectancy and to use these conservative values in the development and improvement of its monitoring program.

Regarding the structural integrity of the Decommissioned Line 3 Pipeline, the Board is satisfied with Enbridge's analysis of the applicable loads that will affect the Decommissioned Line 3 Pipeline and of how live loads will be transferred to it. The Board is also satisfied with Enbridge's assessment of how the Decommissioned Line 3 Pipeline will behave under these applied loads, including the fact that there can be large enough applied loads to overcome the structural capacity of the pipe. The Board has assessed the evidence submitted by Enbridge regarding subsidence failure modes and is satisfied that Enbridge has identified the different potential failure modes. In the Board's view, ground subsidence, as a result of localized or total failure of the pipeline, is a hazard to both the environment and the public and the Board is satisfied with Enbridge's monitoring and mitigation plans. Enbridge should continually develop and update its monitoring program, as it obtains more information about the Decommissioned Line 3 Pipeline.

The Board understands that predicting subsidence profiles is complex and difficult. The Board views Enbridge's models for subsidence to be comprehensive. The models appear to provide reasonable estimates regarding the possible subsidence behaviour of decommissioned pipelines and are a start to developing the knowledge on this subject for the Existing Line 3 Pipeline. In the event of subsidence, the Board would encourage Enbridge to study the subsidence profile to further improve its predictions and evaluate the applied models.

4.2.3 Crossings – Rail and Roads

Views of Enbridge

Enbridge referred to CSA Z662, Table 4.9, which requires a minimum depth of cover of 2 m (6 ft) under railroad tracks and 1.2 m (4 ft) under highway surfaces. Enbridge stated that it would verify the actual depth of cover associated with the railway crossings on the Existing Line 3 Pipeline during detailed engineering.

To ensure the safety of the general public, Enbridge stated that it would conduct additional monitoring of railroad and primary highway crossings using visual inspection of the roadway as well as ground- penetrating radar (GPR) or an equivalent technology to inspect for early indications of voids that could result in subsidence. Enbridge stated it will complete a baseline engineering assessment during detailed engineering to determine the frequency and procedures to be used for these inspections. Enbridge stated that it will be implementing enhanced monitoring activities for active railway crossings, to detect early signs of significant subsidence that could result in damages to person or property.

Enbridge submitted that ground subsidence due to corrosion and pipe collapse has been shown to be a time dependent failure mode. Specifically, this means that possible subsidence due to pipe or casing degradation would likely occur gradually with time; therefore, monitoring with

appropriate intervals is considered an effective response to mitigating this risk. Enbridge indicated it will complete enhanced monitoring of active railroad using visual inspection of the railway as well as GPR or equivalent technology. Detailed calculations and estimates of the proposed time to failure will be used as guidance for establishing the inspection intervals during detailed engineering.

Enbridge submitted there are 26 active railway crossings concerning the Existing Line 3 Pipeline. The 2011 in-line inspection (ILI) of the Existing Line 3 Pipeline indicated that all active railway crossings are cased. Given the predicted corrosion rates on the Existing Line 3 Pipeline, Enbridge indicated the corrosion and the structural integrity model results predict that the Decommissioned Line 3 Pipeline will maintain its load bearing capacity until significant general corrosion (approximately 37% equivalent general wall loss, for the full circumference of the pipe) has occurred for a depth of cover of approximately 1.2 m. Based on the 2008 depth of cover survey, Enbridge expected that all railway crossings will have depth of cover greater than 1.2 m; however, Enbridge will verify this during detailed engineering. Enbridge indicated it does not expect total subsidence to occur, since it has not identified large scale general corrosion on the Existing Line 3 Pipeline.

Views of the Board

The Board is satisfied that Enbridge will implement enhanced monitoring activities for primary highways and railway crossings to better detect early signs of pipe corrosion and subsidence and to allow for mitigation of problem areas before they create a hazard to the public or the environment. The Board reminds Enbridge of its commitment to submit its detailed engineering results to the Board. In addition, the Board imposes **Decommissioning Order Condition 16** requiring Enbridge to cut, fill with an engineered fill material that will provide structural integrity and address the risk of subsidence, and plate all railroad crossings. The condition also requires Enbridge to file its plan for monitoring the integrity of all filled railroad crossings during the Decommissioned Period.

4.2.4 Cathodic Protection and Monitoring

Views of Enbridge

Ongoing Monitoring

Enbridge stated it would continue to monitor the Decommissioned Line 3 Pipeline as part of its ongoing Operations and Maintenance program. Enbridge submitted it would extend certain applicable monitoring procedures currently practiced on active pipelines to the Decommissioned Line 3 Pipeline, in order to address the risks identified. Enbridge's Operations and Maintenance activities include: completing pipeline inspections during patrols; assessing areas of potential geotechnical threats; maintaining pipeline signage; performing depth of cover surveys; and monitoring the CP system.

Enbridge submitted the Decommissioned Line 3 Pipeline will also remain a part of Enbridge's programs for damage prevention and safe work practices, which include: continuing Enbridge's Public Awareness Program; and ensuring ground disturbance activities by Enbridge or third

parties in the vicinity of the pipeline are in accordance with Enbridge construction specifications and Operations and Maintenance Manuals (O&MMs).

Enbridge submitted that it periodically reviews and revises its standards and procedures to incorporate regulatory and legislative changes, updated safe work practices and industrial knowledge, and new technology. Accordingly, Enbridge explained that its ongoing monitoring of the Decommissioned Line 3 Pipeline will progress in the same manner as its active pipelines. Enbridge indicated it may pursue areas of potential research after decommissioning the Existing Line 3 Pipeline due to the limited amount of industry knowledge and established procedures on the behavior of decommissioned pipelines.

Cathodic Protection
Enbridge stated it will continue to apply CP to reduce corrosion rates of the Decommissioned Line 3 Pipeline. Enbridge will conduct an evaluation of the CP system for the Decommissioned Line 3 Pipeline during detailed engineering. Enbridge advised that after decommissioning the Existing Line 3 Pipeline, it will continue monitoring CP in accordance with its Operation and Maintenance Manuals and applicable codes. The application of CP to the Decommissioned Line 3 Pipeline will be assessed on a periodic basis.

Pipeline Depth Monitoring
Enbridge submitted that depth-of-cover surveys utilizing electromagnetic line locating equipment or equivalent technology to accurately locate and record the depths for each pipeline in the RoW will be completed. The depth of cover over the Decommissioned Line 3 Pipeline will be surveyed, assessed, and mitigated in accordance with Enbridge's O&MMs. Enbridge advised that it will complete the depth of cover survey program for the Decommissioned Line 3 Pipeline at least once every ten years. Enbridge may reduce the frequency for the depth of cover survey program for portions of the pipeline based on internal risk assessments.

Enbridge stated that if the measured depth of cover of the Decommissioned Line 3 Pipeline does not meet minimum requirements, it will conduct a risk analysis to assess whether mitigative action is required. This risk analysis will consider land use, underground structures in close proximity, and/or adverse conditions that may prevent the maintenance of such cover. The risk assessment will determine if further action is required, such as: adding soil over the Decommissioned Line 3 Pipeline; lowering the Decommissioned Line 3 Pipeline; developing new agreements to restrict land use with the appropriate stakeholders; or installing mechanical protection over the Decommissioned Line 3 Pipeline.

RoW Patrols, Geotechnical Threat Assessments and Signage
Enbridge submitted that to protect the environment, the integrity of the Existing Line 3 Pipeline and the public in the vicinity, it monitors the RoW by: patrolling the entire RoW plus the adjacent land; documenting and assessing abnormal conditions or activities on or adjacent to the RoW; assessing areas of potential geotechnical instability; and inspecting and maintaining RoW signs and markers.

Enbridge stated that it assesses the Enbridge mainline for geotechnical threats such as areas of potential slope stability or erosion concerns. These areas, when identified, undergo a site-specific assessment, which may recommend more frequent or detailed on-site monitoring.

Enbridge stated that warning signs and line markers are located in key areas to promote awareness in the vicinity of the Decommissioned Line 3 Pipeline. These signs will be visually inspected during regular patrols and, when required, the key information on the signs will be updated. Enbridge also stated that it verifies signage annually to ensure signs are not missing, damaged, and are visible from appropriate roadways and trails.

Views of the Board

The Board considers that Enbridge intends to use its Operations and Maintenance program to monitor the regular monitoring of the Decommissioned Line 3 Pipeline. The Board's conditions regarding monitoring of the Decommissioned Line 3 Pipeline are discussed in section 6.3.

With respect to [illegible] the Board is of the view that applying the [illegible] to the decommissioning the isolating valve 3 Pipeline will be the correct method to maintain the integrity of the pipe. The Board understands that the [illegible] will be accessible [illegible] and [illegible] access road and it will be maintained in accordance with [illegible] and applicable codes.

The Board is of the view that Enbridge has appropriately considered pipeline design, materials, construction, operation and maintenance practices, and integrity management programs in order to ensure the safety of the public and the environment.

The Board finds that Enbridge's approach with respect to [illegible] is appropriate for the circumstances and is consistent with the Board's expectations. In the Board's view, monitoring of the Decommissioned Line 3 Pipeline and maintaining [illegible] the most appropriate manner to handle [illegible] concerns. The Board is satisfied that Enbridge's commitment to maintain [illegible] is appropriate with applicable codes and standards.

6.6 Environment and Socio-Economic Matters

In designing a decommissioning plan, the Board expects applicants to consider environmental and socio-economic risks, and to incorporate measures to reduce those risks. In this Section of the Report, the Board examines the suitability of Enbridge's decommissioning plan from an environmental perspective. In particular, the Board examines the suitability of Enbridge's decommissioning plan to reduce environmental and socio-economic risks associated with leaving the Decommissioned Line 3 Pipeline in place.

The Board's assessment of the potential adverse environmental effects of the Project, including the Decommissioning Activities and leaving the Decommissioned Line 3 Pipeline in place, is presented in Chapter 7.

4.3.1 Decommissioning Activities

The Board assessed whether the Decommissioning Activities proposed by Enbridge are appropriately scoped to address environmental and socio-economic effects associated with leaving the Decommissioned Line 9 Pipeline in place. These effects include, but are not limited to:

- the Decommissioned Line 9 Pipeline being incompatible with present and future land use;
- the Decommissioned Line 9 Pipeline becoming exposed due to geotechnical hazards (erosion, slope instability, scour or overburden loss);
- the Decommissioned Line 9 Pipeline acting as a conduit to transport water, other fluids or contaminants.

[illegible]

[illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Enbridge submitted that, given the Existing Line 3 Pipeline is located within an operating pipeline corridor, the lands within the ROW would not be immediately available for most alternate land uses in future development due to the public safety, environmental and operational [illegible] with existing pipelines. Enbridge stated that, in addition to operational and [illegible] with the Decommissioned Line 3 Pipeline in place, the potential for [illegible] Enbridge stated that it would [illegible] appropriate [illegible] as needed basis.

[illegible] Canada

Enbridge noted that the [illegible] of the Existing Line 3 Pipeline at watercourse crossings [illegible] supported. Enbridge said the burial depth of [illegible] could [illegible] and digital patrols [illegible] adequate to prevent the pipe from becoming [illegible] and damage occurring.

[illegible] Enbridge [illegible] Enbridge [illegible] the probability of the [illegible] Enbridge [illegible] [illegible] [illegible]

d be potentially impacted by
lopes which are vulnerable
omised structural integrity
ssment of the locations along
due to steep surface
hy slope classes greater than
nonitoring for future slope

e Existing Line 3 Pipeline
n strategy for areas of known

tions on the Existing Line 3
the past; however, it noted that
k crossing to relieve stress,
ris River crossing to prevent

sing locations along the
tified 13 watercourse crossings
ing under higher water flow
n the variety of site conditions
on/scour issues associated with
at each watercourse would be
ided its decision-making
e considered. Enbridge
oration; installation of erosion
rip rap, concrete aprons, or
ne lowering and/or reburial; or

ction as a conduit to transport
ime. Enbridge indicated that
consideration in designing its

nmental features due to
m. Specifically, the
n from, or interconnect
, watercourse crossings, areas
and volume of fluids that may
conductivity of surrounding
e of the entry and exit points.

Enbridge considered the following conditions necessary for water conduits to form in a decommissioned pipe:

- there must be through-wall corrosion in the pipeline to allow water to enter it;
- the decommissioned pipeline must be in contact with water (that is, at or below the water table);
- the portion of the pipeline that forms the conduit must be intact;
- there must be a preferential exit corrosion point that allows water to exit following movement within the pipeline; and
- there must be sufficient elevation changes between the entry and exit points to allow for the movement of the water.

Enbridge noted that the 1996 Abandonment Discussion Paper states that ground subsidence may create surface water conduits that are able to intercept and channel drainage along the RoW, and potentially cause erosion and subsequent pipe exposure. However, Enbridge submitted, in its view, this is unlikely, since the geotechnical study and survey of pipeline companies commissioned by the Pipeline Abandonment Steering Committee did not identify any instances of such observed subsidence and associated erosion.

Enbridge indicated that the Decommissioned Line 3 Pipeline, if acting as a water conduit, could transport and release contaminants that would otherwise be immobile. For example, residual materials left in the pipeline after cleaning could be transported and result in soil and groundwater contamination either below or above ground in vulnerable locations such as wetland and watercourse crossings.

Enbridge noted that the following conditions are necessary for contamination to mobilize via the water conduit effect:

- the presence of contamination in an area at risk;
- high enough concentrations of contamination to allow mobility;
- positive hydrostatic conditions that enable inflow into the pipeline;
- an uninterrupted pathway to a sensitive receptor;
- an adequate elevation differential; and
- a sufficient source of contamination to perpetuate migration.

Enbridge stated that the 2010 DNV Pipeline Abandonment Scoping Study identified two groups of potential contaminants that could be a concern as a result of the pipeline remaining in-place: contaminants resulting from corrosion of the pipe (that is, coatings and their degradation products); and residual contaminants from operation of the pipeline (that is, product, treatment chemicals and lubricants) including soil and groundwater contamination that may have resulted from historical leaks and spills during operation. Potential contaminants of concern include: petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and Naturally Occurring Radioactive Materials (NORMs); metals from degradation of the pipe metals (iron, copper,

nickel, molybdenum, chromium and others); and pipeline coatings and their degradation products (coal tar or enamel, polyethylene tape, asbestos, asphalt, fusion bonded epoxy or bitumen and glass-fibre for older pipelines).

Enbridge stated that its cleaning validation program showed that PCB and NORM concentrations within the Line 3 pipeline are below detectable limits and are not a risk to the decommissioning of the Existing Line 3 pipeline, as part of this Project. Enbridge further noted that metals potentially released due to the corrosion of CP surfaces during operation of the pipeline or as a result of corrosion while the pipeline is decommissioned would not be considered a threat to the environment, since metals have a low environmental mobility and are not anticipated to occur within accessible pathways or in sufficient concentrations to affect the environment or human health.

Enbridge noted that the question of *how clean is clean,* specifically for pipelines, has not been resolved, and that the methodology for accurately measuring the presence and concentration of residual contaminants left as a residue within a section of pipeline at the time of abandonment is not well-established and there are currently no applicable standards related to pipeline cleanliness. When designing its cleaning validation program, Enbridge established a target concentration of 100 mg/L of product for the final rinse. Enbridge noted that, upon execution of the program, the resulting concentration was 15.5 mg/L. Enbridge was of the view that, due to thin film dynamics of surface wetting, the residual film left behind by the final cleaning stages is unlikely to pool in the lower pipeline elevations and would cause no harm to the environment. Section 4.2.1 provides further discussion of the cleaning validation program and Enbridge's proposed cleaning methodology for the Existing Line 3 Pipeline.

Enbridge noted that when it was constructed, the Existing Line 3 Pipeline was coated with Polyken 960 tape. Enbridge's risk assessment indicated that the tape would not pose an environmental risk since it does not contain any hazardous components in sufficient concentrations to require a hazardous classification, it is not soluble in water, and it is inert.

Enbridge also provided the locations of all known contaminated sites within Enbridge's mainline corridor as a result of releases from the Existing Line 3 Pipeline and other pipelines within the corridor. The information provided included the year the release occurred, volume released and the status of remediation. As well, Enbridge provided a list of other known contaminated sites in proximity to the Existing Line 3 Pipeline RoW.

Enbridge stated that the key treatment measures to reduce the risks associated with the Decommissioned Line 3 Pipeline acting as a conduit are cleaning the pipeline prior to decommissioning, segmentation, maintaining CP, and ongoing RoW surveillance and maintenance. Discussion of Enbridge's approach to selecting segmentation locations is provided immediately below. Enbridge's approach to cleaning the Existing Line 3 Pipeline is discussed in Section 4.2.1. CP and ongoing monitoring and maintenance is discussed in Section 4.3.2.

Segmentation

Enbridge noted that the 2007 CEPA Report recommends that a decommissioned pipeline be capped, plugged, or otherwise effectively sealed to protect against the creation of water conduits.

Enbridge submitted, in its view, based on the multiple conditions necessary for water conduit formation, the potential for the Existing Line 3 Pipeline to form a water conduit that impacts any particular environmentally sensitive feature is extremely low. Nevertheless, Enbridge stated that it has applied the precautionary principle to address the perceived risk of water conduits. Enbridge indicated that it used a risk-based assessment strategy to evaluate mitigation of the potential impacts of water conduits, including an analysis of the environmental and financial impacts of installing additional segmentation relative to the level of environmental protection afforded. Enbridge stated that it does not propose segmentation for environmentally sensitive areas where there is extremely low risk of impact from the formation of a water conduit.

Enbridge used a two-tiered decision making process for determining segmentation locations. The first tier of the process defined environmentally sensitive areas and identified the potential impacts and mitigation measures to reduce those impacts. The second tier focused on the potential effects associated with the formation of a water conduit and identifying segmentation locations. The considerations Enbridge took into account in choosing locations to segment the Existing Line 3 Pipeline are discussed below:

a) Community Water Supply Sources

Enbridge assessed all communities with municipal boundaries located within 800 m of the Existing Line 3 Pipeline to determine if the municipal water supply was potentially susceptible to the effects of a water conduit. Enbridge then determined if there were any potential topographical highs or engineering isolation and segmentation locations that would act to effectively prevent potential water conduit effects. Enbridge recommended segmentation at locations where the topographical highs did not mitigate the potential effects of water conduit formation at community water supplies.

b) Location of Contaminated Sites

Enbridge stated that all contaminated sites will continue to be managed as part of Enbridge's contaminated sites management program and as per the process outlined by the *NEB Remediation Process Guide*. Enbridge was of the view that, since processes are in-place to manage contaminated sites, contaminant migration is unlikely to occur as a result of water conduit formation within the Decommissioned Line 3 Pipeline, and segmentation at these locations was not warranted. In the event that conditions necessary for water conduit formation are identified, Enbridge indicated that it would establish site-specific mitigation measures. It noted that site-specific remediation measures may include surficial contouring, segmentation, excavation and disposal, in-situ remediation, installation of physical barriers, monitored natural attenuation or site specific monitoring plans.

c) Watercourse Crossings

Enbridge stated that its criteria to identify watercourse crossing locations potentially impacted by the formation of a water conduit considered the location and characteristics of each watercourse crossing, including whether the water body supported sportfish, and the elevation profile at and in the vicinity of the watercourse crossing. Where two or more waterbodies were connected,

Enbridge noted that it treated them as a single waterbody if the water conduit effect would not alter the ecological balance of the connected waterbodies. Enbridge stated that it would implement segmentation at the pipeline crossings of those watercourses which support sportfish and for which topographic highs do not mitigate the potential formation of a water conduit.

d) Wetlands

Enbridge indicated that Class IV, V and VI wetlands would be most affected by the formation of a water conduit since organisms present in those wetlands are not adapted to fluctuating water levels in the same way as organisms in Class I, II and III wetlands. Where two or more wetlands occur in a complex, Enbridge noted that it treated them as a single wetland since a water conduit effect in the Decommissioned Line 3 Pipeline would not alter the ecological balance of a single wetland within the connected group of wetlands. Enbridge stated that it would segment the Existing Line 3 Pipeline on both sides of Class IV, V and VI wetlands or wetland complexes that are intersected by, or are within 10 metres of the centreline of the Existing Line 3 Pipeline, where topographic highs will not mitigate the potential for a water conduit to move water into or out of the wetlands.

e) Connected Drainages

Enbridge indicated that it assessed connected drainages using the same process it used for watercourses, and wetlands and wetland complexes. Enbridge stated that if a connected drainage is in contact with the Existing Line 3 Pipeline and the drainage connects within 400 m to a waterbody identified above as being potentially impacted by the formation of a water conduit (those are, watercourses with sportfish, or Class IV, V or VI wetlands), segmentation would be conducted according to the related more stringent decision-making process. Similarly, if topographic highs mitigate the potential for a water conduit, segmentation would not be conducted.

f) Environmentally Sensitive Areas, Species at Risk and Critical Habitat

Enbridge indicated that it also assessed environmentally sensitive areas along the Existing Line 3 Pipeline to determine if any other site-specific mitigation was required as a result of the pipeline remaining in-place. These areas included: areas protected by regional, provincial, federal or internationally recognized programs such as provincial and federal parks or wildlife preserves; provincial conservation areas or wildlife habitat areas; fish and wildlife fund protected areas; wildlife habitat protection lands; private conservation lands; and private fish and game preserves. Enbridge also considered areas with sandy, sodic or saline soils.

Enbridge stated that it concluded that it was unnecessary to implement segmentation at all environmentally sensitive areas due to the low likelihood of the water conduit effect occurring, and in consideration of the ground disturbance that would be required to segment the pipeline in these areas. Enbridge was of the view that further ground disturbance should be avoided within environmentally sensitive areas, if feasible. Enbridge noted that the Existing Line 3 Pipeline RoW remains part of Enbridge's operations and maintenance program and that it would remain responsible to address any impacts of decommissioning the Existing Line 3 Pipeline to these areas.

Enbridge stated that it considered the presence of documented occurrences of species at risk and critical habitat when developing its segmentation decision-making framework.

Enbridge submitted that it was of the view that the potential impacts to species and critical habitat due to segmentation activities would be greater than the benefits associated with applying the measures. Enbridge stated that it would consider the presence of documented occurrences of species at risk and critical habitat when siting segmentation locations, and ground disturbance in these areas would be avoided, where feasible.

Enbridge determined topographical highs in the vicinity of the environmentally sensitive areas using a computer model which considered water table elevation data, invert pipeline elevation data, the location of existing engineering isolation and segmentation points, and the location of environmentally sensitive areas being considered for segmentation. Following model output, Enbridge stated that it reviewed the segmentation locations to determine if the environmentally sensitive area was already being mitigated by other segmentation and isolation locations to remove redundant segmentation locations. Enbridge noted that it also reviewed all segmentation locations to determine if the modelled locations could be moved to more optimal locations for construction or to reduce impacts to stakeholders or the environment without reducing the efficacy of the protection afforded by the segmentation (for example, locations were moved to road boundaries where practical).

Enbridge stated that it has identified 53 locations along the Existing Line 3 Pipeline where there are no local topographical highs to prevent the movement of material into or out of the pipeline into environmentally sensitive areas, and at which segmentation is being considered. These locations are in addition to the 19 isolation points and the 41 valves that will be permanently closed along the pipeline and which also act to segment the pipeline. Enbridge noted that it expects to revise and refine the segmentation locations as detailed engineering proceeds.

Section 4.2.1 provides further discussion of the techniques that Enbridge proposes to use to segment the Existing Line 3 Pipeline.

Views of the Participants

Several Aboriginal groups requested that Enbridge present and implement a comprehensive action plan to address and remediate any sites along the RoW where past contamination has occurred. George Gordon First Nation (George Gordon) stated that, while it understood that not all areas can be actively remediated due to site conditions or existing infrastructure, it is of the view that decommissioning of the Existing Line 3 Pipeline offered a unique opportunity to address these areas in a safe manner without compromising project schedules or pipeline operation.

The MMF expressed concerns that the Existing Line 3 Pipeline, once decommissioned, could corrode, resulting in a variety of environmental issues including soil and water contamination, and that these issues could ultimately affect wildlife and human populations.

Moosomin and Kahkewistahaw noted that assessing any contamination from old decommissioned lines, decompacting soils, restoring subsoils and strippings, and/or removing surface structures are all primary First Nations' environmental management concerns.

Reply of Enbridge

In response to several concerns raised by Aboriginal groups regarding a lack of commitment to assess and remediate pre-existing contamination along the Existing Line 3 Pipeline RoW, Enbridge submitted that it would continue to manage all contaminated sites according to the *NEB Remediation Process Guide*. It noted that if previously unidentified contamination in the Project area is discovered, it would be managed and remediated according to the guide as well. Enbridge noted that, if there are outstanding contaminated sites at the time of abandonment of the last operating pipeline in the pipeline corridor, it would remediate sites to the applicable provincial and/or federal guidelines according to the standards of the day. It also described the procedures it would undertake if the presence of contaminated soils is suspected, including notifying appropriate regulatory authorities.

Views of the Board

The Board has examined Enbridge's decommissioning plan thoroughly and is of the view that Enbridge has appropriately considered the environmental and socio-economic risks associated with leaving a large-diameter pipeline in-place and has proposed suitable Decommissioning Activities. The Board notes that Enbridge's Decommissioning Activities have been chosen based on the most up-to-date information and literature available. In the Board's view, the Decommissioning Activities are appropriately conservative for the circumstances surrounding the Existing Line 3 Pipeline.

The Board notes that some Participants raised issues related to the assessment and remediation of historical contamination related to the Existing Line 3 Pipeline. The Board has considered these concerns and is of the view that Enbridge's commitment to continue managing known contaminated sites along the Existing Line 3 Pipeline RoW, in accordance with the *NEB Remediation Process Guide*, is appropriate. The Board has regulatory oversight of the Decommissioned Line 3 Pipeline and will continue to monitor Enbridge's progress in remediating those remaining sites.

Since Enbridge's decommissioning plan is still being developed and implementation of the majority of the Decommissioning Activities are not scheduled to commence until after the Line 3 Replacement Pipeline is in operation in 2018, the Board requires Enbridge to file a Final Decommissioning Plan, for approval, prior to commencing Decommissioning Activities **(Decommissioning Order Condition 11)**. Enbridge is required, pursuant to this condition, to describe how input from potentially affected stakeholders and Aboriginal groups has been incorporated into the plan and to provide a description of how any outstanding concerns have been or will be addressed by Enbridge.

Since Enbridge has indicated that buoyancy control measures would be implemented starting in Q2 2017, prior to the displacement of the product from the Existing Line 3 Pipeline, completion of detailed engineering, and commencement of the other Decommissioning Activities in Q2 2018, the Board requires Enbridge to file a separate plan for the implementation of the buoyancy control measures **(Decommissioning Order Condition 6)**.

Both the Final Decommissioning Plan and the Buoyancy Control Measures Implementation Plan must include any additional information obtained from the results of detailed engineering and Enbridge's research and development programs, as well as the factors and considerations, from an environmental perspective, that were used by Enbridge to determine the decommissioning treatments chosen and their final locations.

Since there is uncertainty associated with the effectiveness of many of the Decommissioning Activities proposed by Enbridge to reduce environmental and socio-economic risks, the Board imposes **Decommissioning Order Condition 12**. This condition requires Enbridge to design a scientifically robust decommissioning treatment monitoring program to monitor and verify the effectiveness of the treatment measures after implementation. In the Board's view, this information will not only be of value to Enbridge and those affected by the decommissioning of the Existing Line 3 Pipeline, but it will also add to the knowledge base of industry and regulators. Additional Board reasoning for imposing this condition is provided in Section 4.3.2 below and in Section 7.5 of the Board's environmental assessment for the Project.

4.3.2 Decommissioned Period

As part of its decommissioning plan, Enbridge proposed measures that will be undertaken during the Decommissioned Period to address environmental and socio-economic risks of leaving the Decommissioned Line 3 Pipeline in-place. These measures include maintaining CP, ongoing monitoring and maintenance, and remedial actions as required.

Views of Enbridge

Cathodic Protection
Enbridge submitted that long-term degradation of the Decommissioned Line 3 Pipeline may eventually lead to a measureable amount of ground subsidence as a result of soil infilling the pipeline. It noted that ground subsidence may also occur as a result of the ingress of groundwater into the internal surface of the pipe. Enbridge expected that water and soil accumulations within the Existing Line 3 Pipeline would take place over hundreds of years.

Section 4.2.2 contains additional information on Enbridge's assessment of predicted corrosion rates, failure modes and predicted subsidence profiles for the Decommissioned Line 3 Pipeline. It also describes Enbridge's assessment of the potential consequences of ground subsidence.

Enbridge stated that, to reduce corrosion rates, and potential associated ground subsidence concerns, it would continue to apply CP to the Decommissioned Line 3 Pipeline. As possible subsidence due to pipe or casing degradation or collapse would occur gradually with time, Enbridge indicated that ongoing monitoring at appropriate intervals would be effective in mitigating these risks. Enbridge stated that it would identify future ground subsidence concerns, including any cumulative low spots on agricultural lands, during ongoing RoW monitoring and periodic depth of cover surveys, and any issues would be mitigated in accordance with its O&MMs. Monitoring is discussed in more detail below.

Ongoing Monitoring and Maintenance

Enbridge stated that it operates several pipelines adjacent to the Existing Line 3 Pipeline within its mainline corridor, and as a result, it is committed to ongoing monitoring and maintenance of the mainline corridor rights-of-way, including the Decommissioned Line 3 Pipeline. Enbridge indicated it would continue to ensure the Decommissioned Line 3 Pipeline remains safe for both landowners and the environment. Enbridge further noted that monitoring and maintenance of the Line 3 RoW would continue to be carried out as part of its integrity program and that it would address any concerns that may arise in the future as a result of the Existing Line 3 Pipeline being decommissioned in-place.

Enbridge noted that its operations and maintenance activities include: completing pipeline inspections to identify and investigate any abnormal surface conditions or activities on or adjacent to the RoW; assessing areas of potential geotechnical threats; and performing depth of cover surveys. Enbridge stated that soils, vegetation establishment, invasive weeds, wetland hydrology, and surface and groundwater quality monitoring of the Decommissioned Line 3 Pipeline would be managed in accordance with its O&MMs.

Enbridge stated that it periodically reviews and revises its operations and maintenance standards and procedures to incorporate regulatory and legislative changes, industrial knowledge, and new technology. Enbridge indicated it may pursue areas of potential research after decommissioning the Existing Line 3 Pipeline due to the limited amount of industry knowledge and established procedures on the behavior of decommissioned pipelines.

Enbridge intends to specifically rely on monitoring, and associated maintenance and remedial actions as required, to address risks including loss of depth of cover, geotechnical threats, erosion and scouring at watercourse crossings, pipeline exposure due to insufficient negative buoyancy, and creation of water conduits. These are discussed in more detail below:

a) Depth of Cover

Loss of depth of cover can lead to pipeline exposure. Enbridge stated that it would continue to assess and mitigate the depth of cover over the Decommissioned Line 3 Pipeline in accordance with its O&MMs and pipeline depth of cover management program. Enbridge indicated the surveys will identify areas of soil upheaval, loss of soil coverage, or thaw subsidence areas where the Decommissioned Line 3 Pipeline has reduced cover. Enbridge noted that depth of cover surveys for the Decommissioned Line 3 Pipeline would be completed at least once every ten years, but further noted that the frequency of the program may be reduced for portions of the pipeline based on internal risk assessments.

Enbridge stated that the last depth of survey it conducted for the Line 3 pipeline was in 2008. The results of that survey indicated that < 1% of the pipeline has a depth of cover less than or equal to 0.9 m and > 50% of the line has a depth of cover greater than 1.2 m.

If the measured depth of cover of the Decommissioned Line 3 Pipeline in the future does not meet minimum requirements, Enbridge stated that it would conduct a risk analysis to assess whether mitigative action would be required. Enbridge noted that, in accordance with the Decommissioning Settlement Agreement, it has committed to maintaining the depth of cover over the Decommissioned Line 3 Pipeline, by restoring the depth of cover to a minimum 0.6 m,

or otherwise implementing mitigation measures to ensure continuance of ordinary cultivation and safe crossing of a landowner's farming equipment over the pipeline. Enbridge indicated that the mitigation measures for depth of cover in the Decommissioning Settlement Agreement are consistent with what it committed to in its Application.

Enbridge noted that, given the variety of site conditions along the Existing Line 3 Pipeline and the uniqueness of potential inadequate depth of cover issues, the specific mitigation measure or treatment option that would be applied in the future would be assessed on a case-by-case basis and would be based on detailed engineering assessments. However, Enbridge specified that it would consider the following treatment options: lowering the pipeline, restoring soil, restricting quasi-permanent land use, and installing protective mechanical barriers, temporary localized land use restrictions, and additional signage. Enbridge also provided a decision-making framework that it would use to decide which treatment would be chosen. Enbridge submitted that, based on the results of the detailed engineering assessment and discussions with stakeholders, it would select the most cost-effective treatment with the least overall potential impact to the environment. Enbridge further noted that, if treatments cannot resolve an identified issue completely, it would use pipeline removal to address inadequate depth of cover.

b) Geotechnical Threats

Enbridge submitted that the Decommissioned Line 3 Pipeline RoW would continue to be assessed for geotechnical threats, as part of its operation and maintenance monitoring program. This would include unstable slopes, where instability was identified as being a concern during operations, during implementation of the decommissioning treatments or as identified by Enbridge of being a potential concern in the future. Enbridge stated that any identified areas would undergo a site-specific assessment, which may require more frequent or detailed on-site monitoring, or treatments. It noted that treatment options could include: the replacement of soils, revegetation, installation of gabion matting, and segmentation of the pipeline.

c) Erosion and Scouring at Watercourse Crossings

Enbridge indicated it monitors watercourse crossings system-wide through periodic site inspections and assessments as part of its geohazard program and flood monitoring programs. For those crossings identified as having a moderate to high potential of future erosion or scouring, but where mitigation is currently not in progress or planned to be conducted as part of the Decommissioning Activities, Enbridge stated that it would continue to monitor those crossings during the Decommissioned Period.

Given the variety of site conditions at watercourse crossings along the Existing Line 3 Pipeline and the uniqueness of potential erosion and scour issues associated with each individual crossing, Enbridge stated erosion and scouring of overburden at watercourse crossings would be assessed on a case-by-case basis. Enbridge provided a decision-making framework for how it would select a treatment option to address erosion and scour issues, but noted that the specific treatments to address any identified issues would be decided based on detailed engineering assessment and discussions with stakeholders. Enbridge indicated that it would select the most effective mitigation measure with the least overall potential impact to the environment.

Enbridge indicated that potential treatment options for erosion and scouring could include: depth of cover restoration; installation of erosion protection for the bank, toe and/or bed of the watercourse such as rip rap, concrete aprons and hydraulic structures; barbs or weirs; restoring depth of cover by pipe lowering and/or reburial; and removal of the pipe.

d) Pipeline Exposure due to Insufficient Negative Buoyancy

Enbridge noted that pipeline movement as a result of buoyancy control issues could result in pipeline exposure. Enbridge stated that it would address any buoyancy control issues with regards to the Decommissioned Line 3 Pipeline that are identified during ongoing monitoring and depth of cover surveys.

Enbridge submitted that the treatments it would apply to address future site-specific buoyancy control issues are the same as those that would be applied as part of Decommissioning Activities, as described in Section 4.3.1.

e) Creation of Water Conduits

Enbridge indicated that it would monitor the Decommissioned Line 3 Pipeline for creation of water conduits and address any issues identified. Enbridge noted that the creation of water conduits along the outside of pipelines has not been identified as a historical problem; however, it stated that it if evidence of water conduit formation associated with the Decommissioned Line 3 Pipeline is observed during ongoing monitoring, it would implement similar mitigation measures to those used to correct the issue for operating pipelines.

Views of the Participants

Moosomin and Kahkewistahaw noted that monitoring of the environmental impacts resulting from decommissioning pipelines by Aboriginal groups would greatly assist them in protecting their traditional lands and cultural use characteristics.

The MMF submitted that the adequacy of monitoring and emergency response programs in relation to its rights and interests during the decommissioning and abandonment phases of the Project is inadequate. It is of the view that Enbridge has not specifically addressed the impacts of the Project on the land-use practices, cultural heritage, health and socio-economic welfare of its citizens.

Views of the Board

The Board is of the view that Enbridge has proposed appropriate measures for the Decommissioned Period to address environmental and socio-economic risks associated with leaving the Decommissioned Line 3 Pipeline in-place.

As stated in Section 4.3.1, the Board imposes **Decommissioning Order Condition 12**, which requires Enbridge to design a scientifically robust decommissioning treatment monitoring program to monitor and verify the effectiveness of the treatment measures after implementation. Part e) of this condition requires Enbridge to provide the criteria and thresholds for the circumstances under which modified or additional treatment measures would be applied to the Decommissioned Line 3 Pipeline, or pipe removed, based on the monitoring results. Pursuant to **Decommissioning Order Condition 21,**

Enbridge must report the monitoring results and any adaptive management responses it implements in response to those results. Enbridge must provide a copy of the monitoring reports to potentially affected stakeholders and Aboriginal groups upon request. Further Board views regarding this condition are provided in Section 7.5.3.4.2 of the Report.

In addition, Enbridge's Final Decommissioning Plan, filed pursuant to **Decommissioning Order Condition 11** must contain a description of the parameters that will be monitored on the Decommissioned Line 3 Pipeline RoW as part of Enbridge's operations and maintenance program during the Decommissioned Period.

The Board notes that there is uncertainty concerning the extent of adaptive management or remedial actions that may be required with respect to the Decommissioned Line 3 Pipeline. While the Board acknowledges Enbridge's commitments to apply remedial actions to the Decommissioned Line 3 Pipeline when necessary, the Board is of the view that greater oversight by the Board is required to ensure that public safety is maintained and that the environment is protected. As a result, the Board imposes **Decommissioning Order Condition 18**, which requires Enbridge to notify the Board, in certain circumstances, of planned remedial and adaptive management actions. In the event that greater than 100 m of pipeline will be removed, Enbridge must file an action plan for Board approval. In determining the criteria for when notification would be required pursuant to **Decommissioning Order Condition 18**, the Board relied, in part, on the NEB's Operations and Maintenance Guidance for operating pipelines. The Board is of the view that many of the remedial actions or adaptive management measures that Enbridge may need to implement during the Decommissioned Period would be similar, both in nature and scale, to the measures that are applied to operating pipelines as part of ongoing pipeline operations and maintenance activities.

4.4 Decommissioning as an Interim Step to Abandonment

In its List of Issues, the Board stated that it would consider whether the decommissioning of the Existing Line 3 Pipeline is appropriately an interim step to eventual abandonment or whether it is the final step in the pipeline's lifecycle.

Views of Enbridge

In its Application, Enbridge submitted that it had applied to decommission the Existing Line 3 Pipeline, in accordance with the OPR, since it will be replaced and there will be no termination of service to its customers as a result of removing it from operation. Enbridge further indicated that the Existing Line 3 Pipeline had reached the end of its life and would not be returned to service after it was decommissioned.

Enbridge further stated that its proposed decommissioning plan fully addresses all activities related to the permanent cessation of the operation of the Existing Line 3 Pipeline. Enbridge submitted its approach to decommissioning is the same as it would be if it were abandoning the pipeline. It further noted that it did not anticipate any further abandonment activities for the facilities, aside from the detailed steps presented in its Application. Enbridge submitted that in its view, under the current legislative regime, no differentiation is made between abandoned or

decommissioned facilities with the exception of termination of service. It submitted that the current legal framework does not support decommissioning as an interim step.

Enbridge also noted that the Existing Line 3 Pipeline would cease operation without a discontinuance of service (through construction of the Line 3 Replacement Pipeline), and there are other operating pipelines owned and operated by Enbridge and/or its subsidiaries in the same corridor. So as to not impact those pipelines, Enbridge indicated its view was that the pipeline should remain decommissioned in-place. Regarding the anticipated timing of abandonment of other operating pipelines within its mainline corridor, Enbridge stated that an assumption of 40 years was provided to the Board in its Land Matters Consultation Initiative proceeding.

Enbridge also submitted that because the Existing Line 3 Pipeline is situated in an active corridor between several adjacent operating pipelines, it would be appropriate to treat decommissioning as an interim step to the extent that some activities may be more appropriately deferred to the time when the last of the operating pipelines in the corridor is permanently removed from operations. Enbridge specifically proposed to defer to the time of abandonment of the last operating pipeline in the corridor, the removal of above ground facilities at shared facility sites, and the final remediation of any remaining contaminated sites that have not otherwise been remediated in accordance with the *NEB Remediation Process Guide*. If there are outstanding contaminated sites at the time of abandonment of the last operating pipeline in the corridor, Enbridge indicated that it would complete assessments according to the standards of the day, which may include phased environmental site assessments and remediation to the applicable provincial and/or federal guidelines.

Enbridge also submitted that final land reclamation and remediation assessments of the Existing Line 3 Pipeline would be best undertaken in the future. Enbridge indicated that there are practical limitations of currently conducting land reclamation activities along the Existing Line 3 Pipeline RoW including ground disturbance and safety restrictions when working immediately adjacent to operating pipelines. Additional practical limitations include the presence of additional co-located infrastructure, which would prevent activities from being completed at valve sites, quality and measurement buildings and devices, access roads, fencing and signage. Enbridge stated that it would develop a specific reclamation plan subject to an evaluation of the entire pipeline corridor at the time of abandonment of the last operating pipeline in the corridor.

Enbridge noted that there are no applicable provincial land reclamation objectives for federally-regulated pipelines. It also indicated that no specific expectations, issues or concerns were raised by provincial regulators with regard to provincial soil and groundwater remediation or land reclamation requirements, standards, or guidelines for the decommissioning of the Existing Line 3 Pipeline. Should any specific expectations, issues or concerns regarding soil and groundwater remediation and reclamation requirements, standards or guidelines for the decommissioning of the Existing Line 3 Pipeline be raised by provincial regulators, Enbridge indicated it would work with the regulator to address those concerns.

Enbridge submitted that for any further activities that may be warranted on the Decommissioned Line 3 Pipeline as a result of any change of circumstances from the time of decommissioning of the Existing Line 3 Pipeline to the time of abandonment of the other Enbridge pipelines in the corridor, it would provide the NEB with an updated decommissioning plan at that time.

Views of the Board

In December 2014, the NEB issued updates to the Guidance Notes for Decommissioning Provisions under the OPR (Decommissioning Guidance Notes) and the NEB Filing Manual to provide further clarification regarding the Board's expectations regarding decommissioning of facilities. The updates clarified that all decommissioned pipelines would require an abandonment application at the appropriate time.

The Board notes that its Decommissioning Guidance Notes provide examples of circumstances when decommissioning is appropriate. The facts in this Application are one such example, as the Decommissioning Guidance Notes specify:

> If Pipeline 'A' in a right of way corridor ceases operation without a discontinuance of service, and there are other pipelines (either one or more companies and/or one or more jurisdictions) in the same corridor, Pipeline 'A' may need to remain in a decommissioned state, so as to not impact the remaining operating pipelines until all are ready for abandonment.

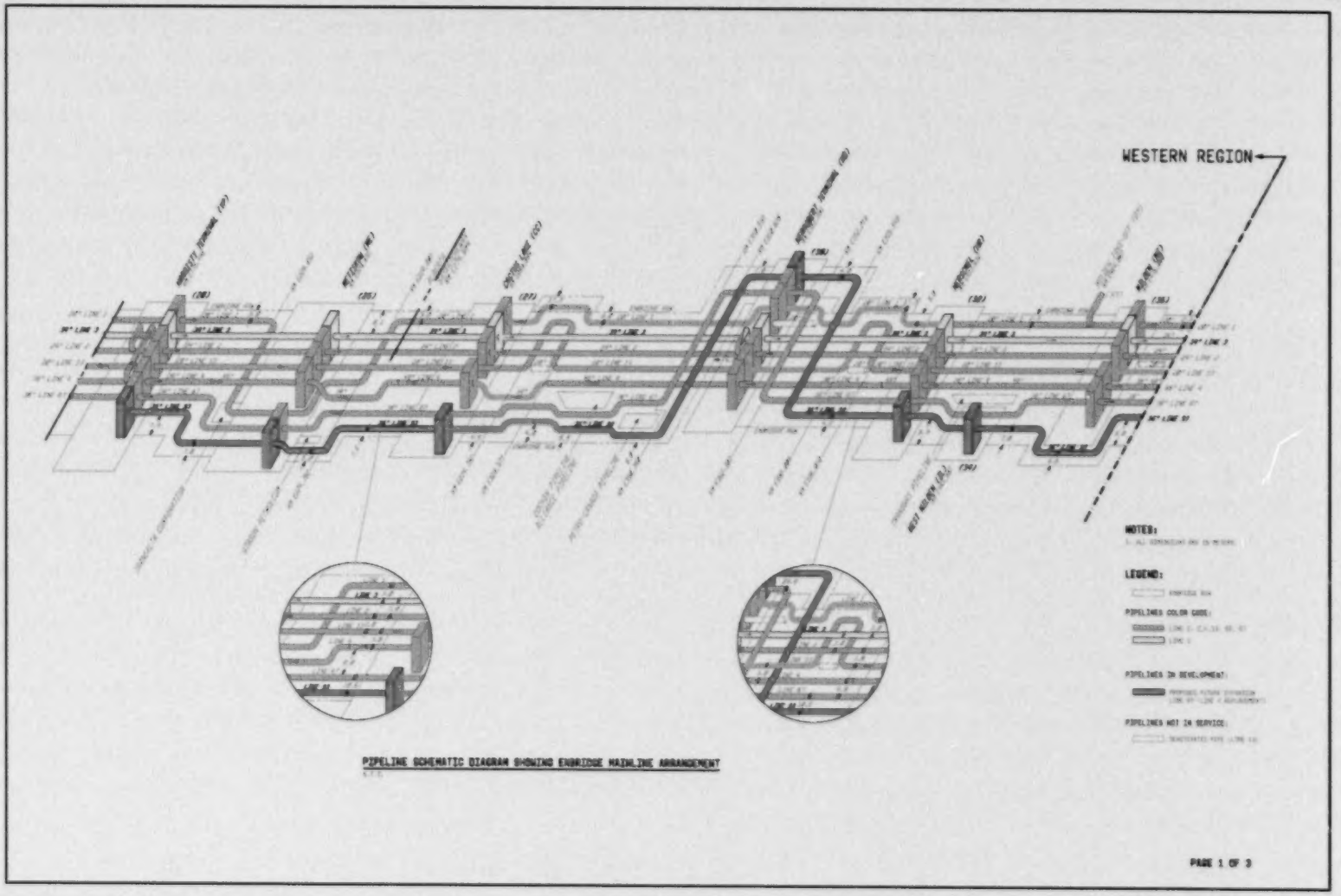
The Board has considered Enbridge's evidence and is of the view that a future abandonment application is required.

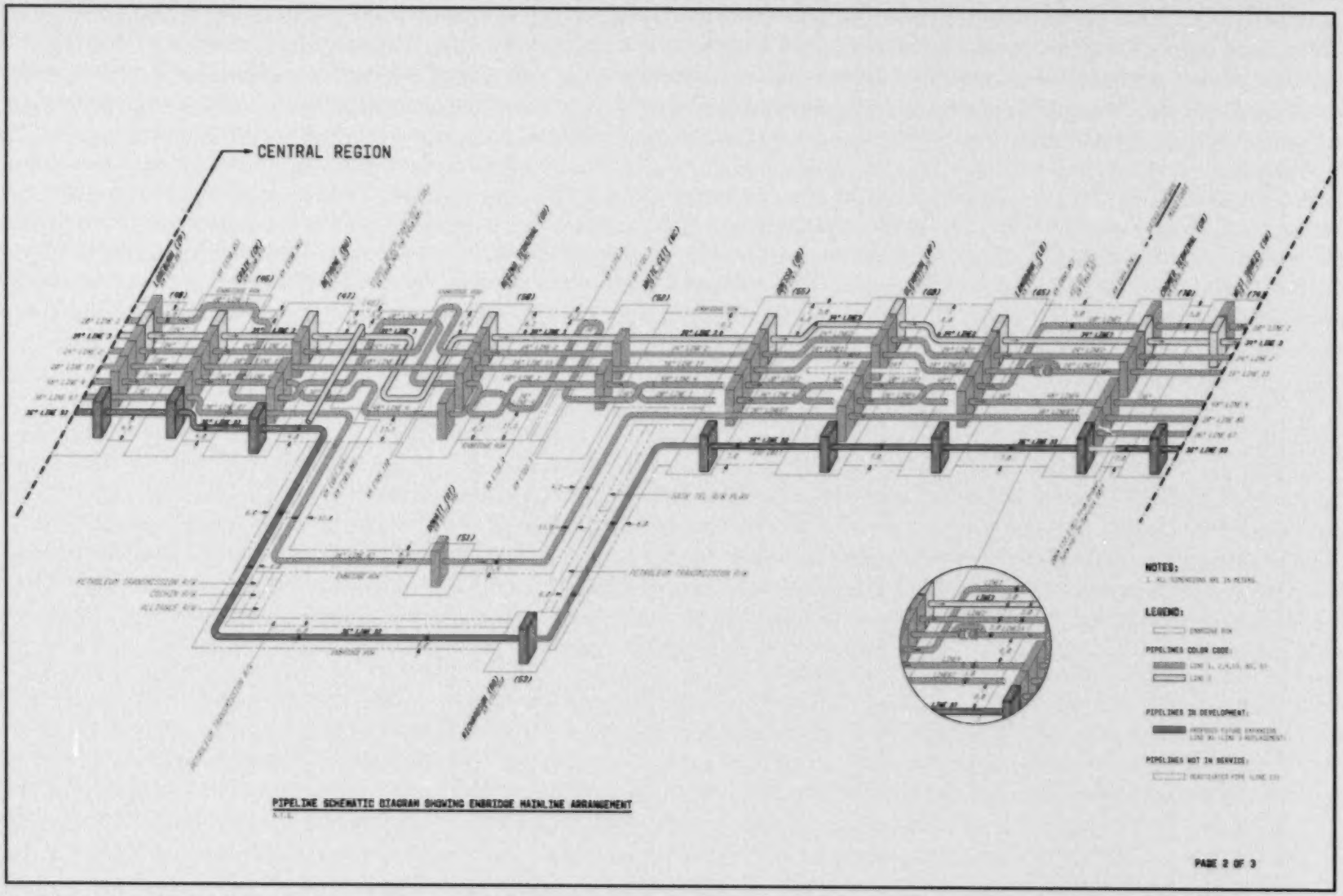
The presence of other operating pipelines in the corridor currently restricts Enbridge's ability to complete some of the remaining steps in the lifecycle of the Existing Line 3 Pipeline, such as removal of above-ground facilities at shared facility sites, and completion of final remediation and land reclamation. In the Board's view, its assessment and approval of these remaining activities should be accomplished by way of a future abandonment application. A future abandonment application will also ensure that stakeholders and Aboriginal groups have the opportunity, at the relevant time, to raise any issues or concerns with the Board and that the remaining activities will be assessed against the requirements and criteria applicable at that time.

The Board therefore imposes a condition requiring Enbridge to file an abandonment application no later than one year after either the remaining steps in the lifecycle of the Existing Line 3 Pipeline can be carried out (excluding ongoing monitoring), or the Board directs Enbridge to do so for all or any part of the pipeline (**Decommissioning Order Condition 22**).

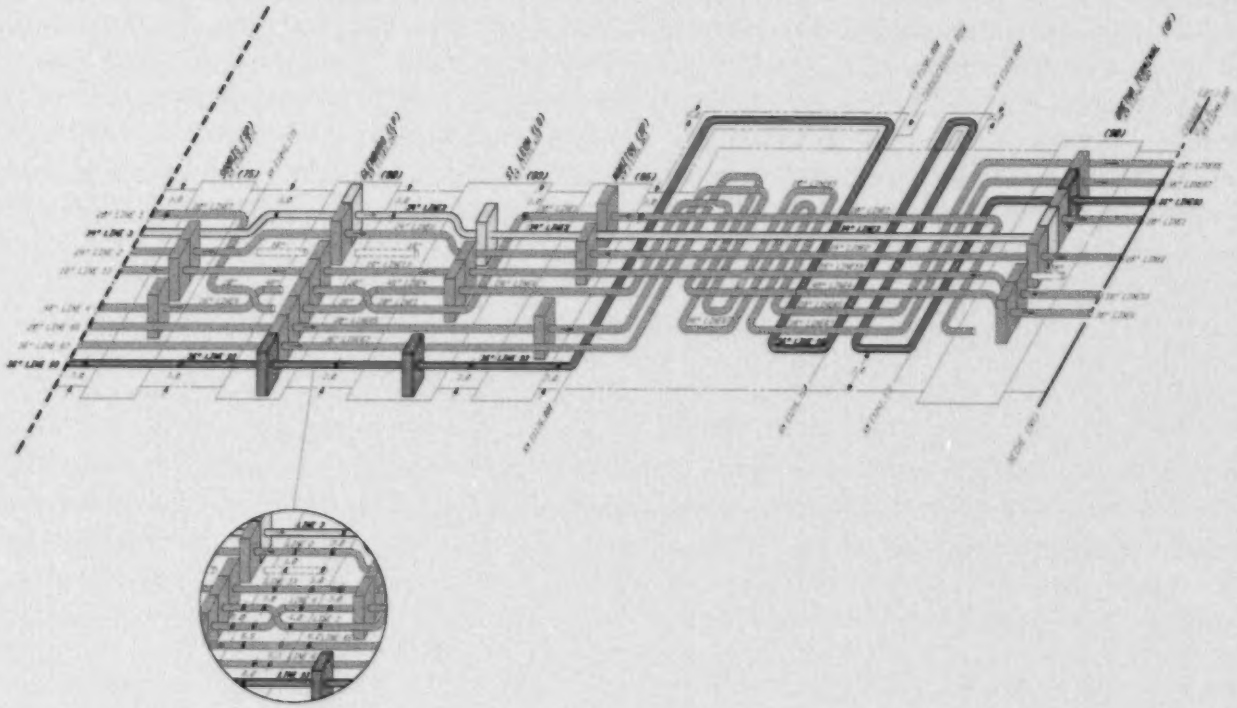
In addition, the Board imposes **Decommissioning Order Condition 20**, which requires Enbridge to file a status report with the Board every five years during the Decommissioned Period. The status report must include: a description of the operating status of the other pipelines in the corridor; a description of the circumstances, if any, that are limiting Enbridge's ability to complete the remaining steps of the life cycle of the Existing Line 3 Pipeline; an outlook as to how the operating status of the other pipelines in the corridor is expected to change in the subsequent five years; a summary of outstanding concerns raised by potentially affected stakeholders and Aboriginal groups regarding the Decommissioned Line 3 Pipeline; and Enbridge's expected timeline for submitting an abandonment application for the Decommissioned Line 3 Pipeline or any part of it. This information will help the Board regularly assess the ongoing status of the corridor, including the continued appropriateness of the Existing Line 3 Pipeline remaining in-place.

Figure 4-1 – Pipeline Schematic Diagrams





PIPELINE SCHEMATIC DIAGRAM SHOWING ENBRIDGE MAINLINE ARRANGEMENT



NOTES:

LEGEND:

PIPELINES COLOR CODE:

PIPELINES IN DEVELOPMENT:

PIPELINES NOT IN SERVICE:

PIPELINE SCHEMATIC DIAGRAM SHOWING ENBRIDGE MAINLINE ARRANGEMENT

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Chapter 5

Public Consultation

5.1 Overview of Enbridge's Consultation with Stakeholders

Views of Enbridge

Enbridge indicated that through its public and Aboriginal consultation, it has worked to build public awareness and understanding, gather and incorporate input, and answer questions raised by stakeholder and Aboriginal groups. According to Enbridge, this input has directly influenced the design of the Project.

Enbridge stated that the objectives of the Project's stakeholder consultation program are to share information about the Project; to seek stakeholders, landowners and regulatory agencies' input for the Project; and also to provide an opportunity for participation in the development of mitigation measures.

Enbridge indicated that its stakeholder consultation program for the Project was designed to ensure that the Enbridge corporate policy, principles and objectives were achieved, and that this program was in compliance with the regulatory expectations set out in the NEB Filing Manual. Specific design elements of the Project stakeholder consultation program included:

- initiating consultation activities early to enable stakeholder input to be considered in Project design and routing/siting decisions;
- providing clear, informative and timely information about the Project to facilitate informed input;
- providing various communication channels to make information available to stakeholders and providing the means for stakeholders to provide their feedback and/or contact Enbridge representatives; and
- notifying all potentially affected stakeholder groups about the Project and available opportunities to participate in a manner appropriate to their needs.

Enbridge submitted that it initiated its consultation program for the Project in June 2013. Over 2,400 stakeholders were identified as being interested in and/or potentially affected by the Project, including:

- landowners, occupants, tenants and Crown disposition holders with land interests crossed by the Project RoW;
- landowners, occupants, tenants and Crown disposition holders with land interests located within 200 m of the Project RoW;

- local governments (municipal, provincial and federal representatives);
- federal and provincial regulatory agencies;
- landowner groups;
- the general public;
- non-government organizations (NGOs);
- recreation groups;
- trappers, guides and outfitters; and
- navigable water users.

5.2 Public Consultation Activities

Views of Enbridge

Enbridge submitted that the consultation program for the Project consisted of a number of activities, including: mail-outs of Project notification packages, meetings, establishment of a Project email address, toll-free telephone number and webpage, coffee talks; open houses; and distribution of subsequent Project update newsletters.

Enbridge indicated that in August 2013, it sent out a Project notification package to potentially affected stakeholders, local governments, regulatory agencies and interested parties via a general Project mail-out.

The mail-out included an introductory letter, Project brochure and Project map, and was delivered to stakeholders in person, by mail or by email. In addition, stakeholders who received their mail-out by post or hand delivery, rather than email, also received a postcard that they could return to Enbridge in order to request a meeting with Enbridge representatives.

The Project notification package also included certain NEB brochures, *Pipeline Regulation in Canada: A Guide for Landowners and the Public* (NEB 2010) and *Regulating Pipeline Abandonment* (NEB 2011).

In March 2014, due to an expansion to the Project scope and an accompanying change in potentially affected or interested stakeholders, Enbridge sent out a similar Project notification package to potentially affected stakeholders, local governments, regulatory agencies and interested parties via a general Project mail-out.

Enbridge indicated that it is committed to providing stakeholders with regular updates on Project milestones.

Enbridge confirmed that it would continue to work with stakeholders to identify and address their interests and concerns and to resolve them in a manner that meets the interests of all parties.

Enbridge submitted that it remains committed to ongoing consultation throughout the lifecycle of the Project.

5.3 Consultation with Landowners, Residents and Other Potentially Affected People

Views of Enbridge

Enbridge submitted that it has consulted with all landowners, occupants and tenants with land interests crossed by the existing and proposed Line 3 RoW.

Enbridge expressed that in late 2013, it began meeting with the Manitoba Pipeline Landowners Association (MPLA) and the Canadian Association of Energy and Pipeline Landowners Associations/Saskatchewan Association of Pipeline Landowners (CAEPLA/SAPL) regarding the Project. Enbridge confirmed that it was able to resolve outstanding concerns of CAEPLA/SAPL/MPLA regarding both the Decommissioned Line 3 Pipeline and the Line 3 Replacement Pipeline, as the parties signed two settlement agreements dated 5 June 2015 and 5 March 2015, respectively.

Enbridge stated that these negotiated agreements were the result of significant engagement and negotiation with the landowner associations and their members, and they are very comprehensive agreements that go beyond matters of compensation. The Construction Settlement Agreement dealing with the Line 3 Replacement Pipeline sets out numerous construction and operation requirements, and includes a wet soil shutdown procedure, a weed management program, and a very detailed clubroot biosecurity agreement. The Agreement includes specifications regarding clubroot sampling associated with integrity digs, additional test audit and reporting procedures, greater detail and prescriptions regarding implementation of mitigation, and a process for dispute resolution. The Decommissioning Settlement Agreement addresses numerous decommissioning procedures, such as depth of cover monitoring, restoration of subsidence, remediation of contamination, and an integrity dig process. It provides specific details to landowners regarding surface disturbances associated with decommissioning activities. It also provides for joint CAEPLA-Enbridge independent research to be undertaken with respect to the impacts of decommissioning and abandoning pipelines in-place. Pursuant to the Decommissioning Settlement Agreement, landowner concerns with respect to the decommissioning are to be the subject of continuing consultation between the parties.

Enbridge indicated that the mitigation measures outlined in the Construction Settlement Agreement and the Decommissioning Settlement Agreement are complementary to the mitigation proposed in its Application. Enbridge stated that although the Application is not as prescriptive as the Agreement, the mitigation will be applied consistently to all landowners.

Enbridge confirmed that it consulted with directly affected landowners and potentially affected stakeholders within a 1.5 km radius in regard to horizontal directional drill (HDD) operations and noise impacts. Enbridge advised that no concerns have been raised to date, but that it would continue to engage these parties with HDD updates, which include pre-construction notifications.

Enbridge submitted that the landowners directly affected by the decommissioning of the Existing Line 3 Pipeline have been provided Project information and updates, and the opportunity to participate in personal consultation.

Enbridge noted that the landowners' concerns related to the decommissioning of the Existing Line 3 Pipeline are:

- The pipeline being left in-place;
- Liability;
- The pipeline affecting their land value;
- Pipeline deterioration;
- Pipeline corrosion caused by water;
- Weed control on the Decommissioned Line 3 Pipeline RoW;
- Soil erosion;
- Pipeline cleanliness;
- Pipeline monitoring; and
- The potential for the creation of water conduits.

Enbridge submitted that it will continue to actively engage landowners and occupants directly affected by the decommissioning to inform them of the decommissioning plan overall and specifically their affected land, and to discuss and address their concerns to the extent possible. Enbridge anticipated that to the extent practicable, by the time the hearing would begin, all identified potentially affected landowners and occupants will have been personally engaged.

Enbridge indicated that the results of consultation activities with landowners and municipal governments are used to inform the mitigation that makes up the Project-specific Pipeline EPP. Enbridge further indicated, prior to filing its Application, the development of the Pipeline EPP and consultation were occurring concurrently, and the completed and compiled EPP was not available as a document for review. However, the proposed mitigation measures were available for review and were communicated to stakeholders. As an example, Enbridge submitted proposed mitigation measures regarding biosecurity, which were revised following consultation with landowners.

Enbridge indicated although the Decommissioned Line 3 Pipeline will never go back into service, it would continue to engage beyond the NEB application process, and that it will be responsible for any ongoing maintenance costs and will ensure that the pipeline remains safe for both landowners and the environment.

5.4 Consultation with Government Stakeholders

Views of Enbridge

Enbridge submitted that consultation (by email, phone and in-person meetings) was conducted with environmental regulators in order to obtain input from the regulatory agencies on the Project design and ESA requirements. During the meetings, regulators were given an overview of the Project and had the opportunity to provide feedback.

Views of the Board

With respect to public consultation, the Board acknowledges Enbridge's efforts to identify and consult with potentially affected and interested stakeholders and its commitment to continuing to consult throughout the lifecycle of the Project. Enbridge initiated consultation with Government stakeholders and landowners early in the process. The Board expects Enbridge to continue its efforts to consult and to maintain effective and timely consultation activities with Government stakeholders and affected landowners, as appropriate, throughout the lifecycle of the Project.

The Board is of the view that both the Decommissioning Settlement Agreement and the Construction Settlement Agreement between Enbridge and CAEPLA/MPLA/SAPL are a positive initiative and encourages their use to resolve issues to the parties' mutual satisfaction. The Board is satisfied that Enbridge will apply the mitigation set out in these Agreements consistently to all landowners.

The Board is of the view that Enbridge has undertaken an appropriate level of public consultation commensurate with the setting, nature and magnitude of the Project. The Board is satisfied that Enbridge has notified all affected stakeholders and has worked to address their concerns. The concerns of Mr. Stewart Crone are specifically addressed in Chapters 3, 4 and 7. The Board expects Enbridge to continue to consult with all stakeholders, as appropriate, throughout the life cycle of the Project.

The Board imposes conditions requiring Enbridge to provide a plan for consultation with landowners during the operational phase of the Line 3 Replacement Pipeline and during the Decommissioned Period for the Decommissioned Line 3 Pipeline **(Certificate Condition 30, Section 58 Order Condition 22** and **Decommissioning Order Condition 15)**. Enbridge is required to file, five years after commencing operation of the Line 3 Replacement Pipeline and five years after completing Decommissioning Activities, as applicable, a report summarizing the outcomes of these plans, assessing their overall effectiveness, and summarizing changes or improvements that have been made to the plans **(Certificate Condition 37, Section 58 Order Condition 30** and **Decommissioning Order Condition 19)**. The Board also imposes conditions requiring Enbridge to maintain detailed records of landowner issues resolution throughout the lifecycle of the Project **(Certificate Condition 33, Section 58 Order Condition 25** and **Decommissioning Order 9)**.

Chapter 6

Aboriginal Matters

The Board interprets its responsibilities in a manner consistent with the *Constitution Act, 1982*, including section 35, which recognizes and affirms the existing Aboriginal and treaty rights of Aboriginal peoples. In order to ensure that its recommendations and decisions with respect to this Application are consistent with both section 35 of the *Constitution Act, 1982*, and procedural fairness requirements, the Board has adopted the following assessment process.

The Board notes that the Government of Canada, through the Major Projects Management Office of Natural Resources Canada, indicated in letters to potentially affected Aboriginal groups that it is relying on the NEB process to the extent possible to fulfill any Crown duty to consult Aboriginal groups for the proposed Project.

The Board's process was designed to obtain as much relevant evidence as possible on Aboriginal concerns about the Project, potential Project impacts on Aboriginal interests and possible mitigation measures. In addition to providing technical information addressing impacts of the Project on, among other things, fisheries, wildlife, vegetation, and heritage resources, Enbridge was required to make all reasonable efforts to consult with potentially affected Aboriginal groups and to provide information about those consultations to the Board. This included evidence on the nature of the interests potentially affected, the concerns that were raised and the manner and degree to which those concerns have been addressed. Enbridge was expected to report to the Board on all Aboriginal concerns that were expressed to it, even if it was unable or unwilling to address those concerns. Therefore, even if an Aboriginal group chose not to participate in the hearing process, any concerns could be brought to the attention of the Board through Enbridge's evidence.

This early consultation was guided by the Board's Filing Manual Requirements, information given by the Board during the Project Description phase, as well as information Enbridge may have received from other government departments and agencies that it consulted in relation to the Project. These requirements reflect the fact that the applicant is most often in the best position to respond to Aboriginal concerns about a project before an application is filed and while the project is still in the early stages of development.

The Board expects an applicant to design and implement its consultation activities with regard to the nature and magnitude of a project's potential impacts.

Where there is a greater risk of more serious impacts on Aboriginal interests (which will in part depend on the nature of that interest), the Board has greater expectations in terms of the applicant's consultation with the potentially impacted Aboriginal group. By the same token, where there is a remote possibility of an impact on Aboriginal interests, or the impacts are minor in nature, the applicant's consultation will generally not be expected to be as extensive.

In addition to the one-on-one consultation that is to occur between an applicant and potentially impacted Aboriginal groups, it should also be understood that the Board's hearing process itself, including this Report, is part of the overall consultative process. While much of the early consultation was performed by Enbridge, the Board process itself acts as a necessary and important check on that consultation and gives Aboriginal groups an additional avenue to explain their concerns about the proposed Project and have those concerns carefully considered by the Board.

Aboriginal groups who are concerned with the potential impact of a proposed Project on their interests had opportunities to present their views directly to the Board. Details on participation of Aboriginal groups in the hearing are set out in Section 6.2 of this Report. Such submissions included, among other things, descriptions of the nature and extent of their interests in the Project area, views on the potential impacts of the Project, and discussion of appropriate mitigation measures, including their views on the draft conditions the Board released for comment.

While the Board required Enbridge to identify Aboriginal groups potentially affected by the Project and implement a consultation program, the Board also took steps to facilitate the direct participation of Aboriginal groups in the hearing. The Board sent letters to each potentially impacted Aboriginal group, informing them of the Project as well as the Board's role in respect of the Project. The letters provided information regarding the Board's participant funding program and offered to provide further information on the hearing process. Board staff followed up on these letters, responded to questions regarding the Board's process and conducted information meetings if requested.

Given the comprehensiveness of the Board's process, the Board's technical expertise and its broad remedial powers that are generally not within the purview of other government departments, it was important that concerns related to the Project were brought to the Board's attention through consultation with Enbridge and participation in the hearing process. To the extent that other government departments had information to provide to the Board, they had the opportunity to participate in the Board's process and file relevant information on the Board's record.

In certain cases, there were concerns identified by Aboriginal groups during the Board proceeding that were not Project-specific. The Board recognizes that Aboriginal peoples have a broad range of matters and concerns that they wish to raise, discuss and resolve with the Government of Canada. While the Board recognizes the importance of these issues, the Board does not have the ability to properly address issues that are unrelated to the Project and Project impacts within its proceedings. Nevertheless, the Board carefully considered all of the submissions of Aboriginal groups so that it could have a greater understanding of the context for Aboriginal concerns with the Project.

Before making its decisions and recommendations on the Project, the Board considered all relevant information before it, including information regarding the consultation undertaken with Aboriginal groups, the views of Aboriginal groups, the Project's potential impacts on Aboriginal interests and proposed mitigation measures. In assessing the potential impacts of the Project and

determining whether it is in the public interest, the Board considered the nature and extent of the Aboriginal interests in the context of how the Project may affect such interests. The Board also took into consideration proposed measures that would avoid or mitigate Project impacts on Aboriginal interests. The Board then considered all of the benefits and burdens associated with the Project, reconciling Aboriginal concerns with other interests and factors (such as the need for the Project), before determining whether, in its opinion, the Project is in the public interest.

The Board's process is designed to be thorough, open and accessible to Aboriginal groups so that they may make their concerns known to the Board and have those concerns considered and addressed as appropriate. Further, the open nature of the Board's process allowed all participants interested in the Application to be fully aware of the evidence that the Board considered in making its recommendations and decisions on the Project, which is consistent with principles of procedural fairness.

It is important to understand that there is a need for consultation to occur early in the planning stages of a project. However, information about a project is necessarily refined as project planning progresses, including in response to information provided by Aboriginal groups through consultation, and therefore, it is important that consultation is ongoing. The Board has set out broad expectations for all regulated companies that consultation will continue throughout the life of a project and the Board routinely imposes binding obligations on the applicant to ensure that such consultation is occurring in an appropriate manner throughout the lifecycle of a project. As the regulator of a project throughout its lifecycle, the Board also has a number of processes and tools at its disposal to execute its oversight of a project, including ensuring compliance with any conditions imposed by the Board.

6.1 The NEB's Enhanced Aboriginal Engagement (EAE) Process for the Project

The Board's EAE initiative aims to provide proactive contact with Aboriginal groups that may be affected by a proposed project, and to help Aboriginal groups understand the Board's regulatory process and how to participate in that process. The Board reviews the completeness of the list of potentially affected Aboriginal groups identified in the proponent's Project Description filed with Natural Resources Canada's Major Projects Management Office (MPMO) and the Board. The Board then sends letters to each potentially affected Aboriginal group on the revised list, informing them of the project as well as the Board's regulatory role in respect of the project, and offers to provide further information on the hearing process. Following issuance of these letters, Board staff follow up, respond to questions or conduct information meetings, where requested.

The Board carried out its EAE activities for the Project between 18 July 2014, when it received the Project Description, and 16 April 2015. The Board sent a letter to 102 potentially affected Aboriginal communities and organizations. The letter discussed the Board's hearing process, its Participant Funding Program and included a summary of the Project. Fifteen Aboriginal groups requested and were accommodated with meetings on the Board's hearing process.

6.2 Participation of Aboriginal Groups in the Hearing

Thirty-seven Aboriginal groups participated as Intervenors and Commenters in this proceeding and provided their comments, views and evidence through written submissions and oral traditional evidence to the Panel. Appendix II provides a summary of how each Aboriginal group participated in the hearing.

The Board recognizes that Aboriginal peoples have an oral tradition for sharing lessons and knowledge from generation to generation. Since this information cannot always be shared adequately in writing, and the Board finds it valuable for its consideration of a project, the Board provided Aboriginal groups with the opportunity to present oral traditional evidence (OTE) at the Board's oral hearings in Manitoba and Alberta. The Board held oral portions of its hearings in locations near those interested in the Project, offered opportunities to participate remotely, if requested, and accommodated requests to incorporate traditional ceremonies into its proceeding. The opportunity to present OTE was unique to Aboriginal Intervenors; and, fourteen Aboriginal groups presented OTE at the hearing.

6.3 Aboriginal Consultation by Enbridge

Enbridge indicated that the design of its Aboriginal consultation program was based on the policies and principles of its company-wide Aboriginal and Native American Policy. It involves a number of activities including: mailing out letters and Project information materials, face-to-face meetings and ongoing tracking and follow-up activities for any identified interests or concerns.

Enbridge identified potentially affected Aboriginal communities through publicly available information, its own knowledge of the Aboriginal groups in the Project area based on its history of project development and operating pipelines and facilities, and by adhering to NEB and other Crown agencies' requirements. Enbridge also acknowledged Aboriginal groups that independently came forward as being interested in or potentially affected by the Project.

6.3.1 Enbridge's Consultation Activities with Aboriginal Groups

Enbridge indicated that, beginning in July 2013, it provided information to Aboriginal groups detailing proposed plans for the Line 3 Segment Replacement Program, which was part of Enbridge's comprehensive system-wide preventative maintenance program. Enbridge originally identified seven Line 3 pipeline segments for replacement (Line 3 Segment Replacement Program). The Line 3 Segment Replacement Program subsequently transitioned into the Line 3 Replacement Program to include the Line 3 Replacement Pipeline component of the Project. Once the public announcement of the more comprehensive Project was made on 4 March 2014, Enbridge expanded its list of Aboriginal groups and provided information detailing the Project's new scope.

Enbridge submitted that it initially identified and consulted with 77 Aboriginal groups and organizations. Based on the Aboriginal groups identified by the Board and the Crown, through Aboriginal Affairs and Northern Development Canada, as it then was, and the MPMO, Enbridge

expanded its Aboriginal consultation program to include a total of 145 Aboriginal groups and organizations.

Enbridge submitted that, at the time of filing its Application, information regarding both the Line 3 Segment Replacement Program and the Project had been distributed in over 175 face-to-face meetings and community drop-ins. Including Project information packages, Enbridge indicated that it had distributed over 250 mail-outs containing information about the Line 3 Segment Replacement Program and the Project, Project contact information and formal responses. Over 520 phone calls, emails and text messages had been placed regarding both the Line 3 Segment Replacement Program and the Project. Enbridge also indicated that it had and would continue to assess information provided by Aboriginal groups regarding traditional land use information and how it may relate to the Project. Enbridge further submitted that it had developed publically accessible web content to specifically address Aboriginal interests and concerns.

In December 2014, the Board asked Enbridge to submit engagement logs for all Aboriginal consultation undertaken to date and to provide an indication of when it would provide further updates and updated engagement logs related to its ongoing Aboriginal consultation for the Project. Enbridge provided engagement logs for the time period from July 2013 to 24 December, 2014. Enbridge filed updated engagement logs in April, July and October 2015.

6.3.2 Concerns raised by Participants about Enbridge's Aboriginal Consultation Program

Several Aboriginal groups expressed their satisfaction with Enbridge's engagement process for the Project. George Gordon First Nation (George Gordon) acknowledged that Enbridge showed it respect and was considerate of its perspective during their bilateral engagement. It indicated Enbridge has shown a willingness to engage with George Gordon and that it had entered into discussions with Enbridge regarding the role it will play in executing stewardship during the Project. George Gordon stated that Enbridge has helped it develop a meaningful partnership; therefore, it supports the Application.

Southern Chiefs Organization (SCO) submitted that it has a good relationship with Enbridge. It entered into an engagement agreement with Enbridge regarding the Project and negotiated an economic partnership with Enbridge.

Moosomin First Nation (Moosomin) submitted that Enbridge has treated it with respect and has been fair and reasonable in its dealings with them. Moosomin stated that it supports the Project.

Several Aboriginal groups submitted that there were flaws in the design, intent and process of Enbridge's consultation with Aboriginal groups. The Assembly of Manitoba Chiefs (AMC) indicated that Enbridge undertook an ad-hoc approach to engagement and failed to provide a detailed explanation of the purpose and structure of the process. AMC also submitted that it appears that Enbridge views engagement as something to be done to, as opposed to with, Aboriginal groups. Samson Cree Nation (Samson) submitted that the consultation, mitigation, and accommodation offered by Enbridge were not appropriately conducted for the Project.

Peguis First Nation (Peguis) submitted that Enbridge's failure to identify Peguis on its initial list of Aboriginal groups for engagement inhibited both Enbridge and Peguis from collecting and compiling information that is necessary for the Board to consider in terms of the Project impacts on traditional land use and Enbridge's proposed mitigation measures. Piikani First Nation (Piikani) submitted that it has not had a good working relationship with Enbridge, which has caused delays in completion of its Traditional Knowledge Study.

A number of Aboriginal groups expressed concerns over the lack of information shared by Enbridge as part of the engagement process. Michel First Nation (Michel) indicated that neither the Crown nor Enbridge provided it with adequate information on the size and scope of the potential negative impacts of the Project on Michel's Aboriginal and treaty rights. Pine Creek First Nation (Pine Creek) submitted that its expectations are that there will be transparent, full and meaningful disclosure of information relating to the Project, which is necessary for Pine Creek to consider in relation to protecting its interests.

Some Aboriginal groups also expressed concerns regarding the timeliness of engagement activities. For instance, AMC submitted that the timing of engagement and the amount of time allowed for the engagement process was inadequate for meaningful engagement with many communities. AMC indicated that for many Manitoban First Nation communities, engagement throughout 2013 and 2014 was limited to a single project information mail-out and that half of First Nation communities in Manitoba had not engaged in bilateral dialogue with Enbridge prior to 2015.

Asini Wachi Nehiyawak Traditional Band (AWNTB) indicated that it had contacted Enbridge regarding its interest in the Project, but had not been consulted until it was accepted as an Intervenor in the hearing process. Peguis submitted that the absence of information about traditional land use activities presently before the Board is a direct result of Enbridge's chosen methods and timing of Aboriginal engagement activities.

Several Aboriginal groups submitted that Enbridge did not include the input from Aboriginal engagement into the Project design. AMC submitted that Enbridge's analysis of the engagement log finds not one instance where detailed information is provided explaining how an issue or concern raised by one of the 26 Aboriginal communities or eight Aboriginal organizations in Manitoba was then fed into Project design and decision-making. AMC also submitted that the vague Project application and engagement log and the secrecy over Enbridge's dealings with Aboriginal groups makes it difficult to get a clear picture of the incorporation of traditional knowledge into the Project design. Peguis submitted that Enbridge did not identify any concerns raised by Peguis as part of its consultation and engagement program and that the absence of information about traditional land use activities presently before the Board is a direct result of Enbridge's chosen methods and timing of Aboriginal engagement activities. Dakota Tipi First Nation (Dakota Tipi) indicated that Enbridge did not respond to urgent requests for discussions to enable it to work within the timelines of the hearing process.

Some Aboriginal groups expressed concern that Enbridge's inclusion of Aboriginal groups in the engagement process was contingent upon providing support for the Project. AWNTB submitted that Enbridge subsequently excluded it from the consultation process when it would not sign a

blanket Letter of Support. Dakota Tipi indicated that a key issue for it was that in order to finalize its agreement with Enbridge, it was asked to sign a template form letter saying that it found Enbridge's engagement process satisfactorily addressed any of the issues and concerns of the Dakota Tipi.

Several Aboriginal groups, such as Ochapowace Nation (Ochapowace), expressed concern that Enbridge's Aboriginal engagement process would lapse if the Project were approved. Pine Creek also indicated that the Aboriginal perspective must continue to form part of the dialogue in the Project and others like it, and due weight must be given to the views and priorities of community stakeholders.

AMC recommended that Enbridge make a committed effort to work collaboratively with concerned stakeholders to jointly achieve beneficial involvement in project planning and the collaborative resolution of pipeline risk disputes. AMC provided two specific recommendations for meaningful engagement for building relationships: engaging with Elders and Knowledge Holders to identify actions needed to improve relationships between Enbridge and Aboriginal groups and other Indigenous peoples; and contributing to Aboriginal groups and other Indigenous peoples' education and training programs.

Reply of Enbridge

Enbridge acknowledged the importance of engaging with Aboriginal groups and indicated that its engagement has been both thorough and uncommonly geographically expansive, involving dialogue with Aboriginal communities with Reserve lands that are over 200 km from the pipeline route.

Enbridge submitted that its engagement logs show its extensive efforts to initiate dialogue as well as its efforts to provide Project-related benefits to Aboriginal groups even in the absence of Project-specific impacts. In specific response to AMC's evidence, Enbridge indicated that, in various responses to information requests, Enbridge repeatedly characterized "engagement" as consisting of a bilateral dialogue involving the sharing by Enbridge of Project-related information and the receipt by Enbridge of issues, concerns and Aboriginal traditional knowledge particular to Aboriginal groups.

Enbridge submitted that it has, and will continue, to seek and foster successful working relationships with Aboriginal groups in the vicinity of its operations. The nature and level of engagement, including ways to enhance relationships, will reflect feedback and expressions of interest from the groups. Enbridge expressed it has participated in land blessing and relationship strengthening ceremonies in respect of the Project and will continue to do so at the guidance and direction of engaged Aboriginal groups. Enbridge has also stated that it is working to create training and employment opportunities for Aboriginal people and groups, which is discussed in more detail in Chapter 8 of this Report.

Enbridge submitted that its Aboriginal and Native American Policy guides its Aboriginal engagement activities, which include developing relationships, exchanging information respecting Enbridge projects, hearing Aboriginal project-specific interests and concerns,

addressing such interests and concerns, and ensuring ongoing dialogue about Enbridge projects, their potential implications and benefits.

Enbridge also indicated that many Aboriginal groups have expressed support for the Project as a consequence of Enbridge's engagement process and there is a lack of filed written evidence from Aboriginal groups about the inaccessibility of Project-related information, or the absence of opportunities to communicate with Enbridge about potential impacts.

Enbridge submitted that Michel was not included in the Aboriginal Engagement Program at the outset because it does not have a Reserve or treaty entitlement lands within 80 km of the RoW; and, Enbridge has had no operational history of engagement with Michel on projects in the same corridor. However, Enbridge engaged with Michel after it was contacted by a law firm that was retained by the Friends of Michel Society. On 26 November 2014, Enbridge provided a comprehensive notification package for the Project Application filing. Enbridge advised that it will continue to engage with Michel for the purposes of exchanging information respecting the Project, and hearing and addressing any concerns that may be raised, to the extent practicable.

Enbridge submitted that Aboriginal traditional knowledge has informed the routing and construction planning for the Project, and it will also be used to guide long-term operations. Specific examples of this include water stewardship initiatives, participation in land blessing and protection ceremonies, awareness of and adherence to cultural protocols, and Aboriginal involvement in ongoing Project assessment programs.

In addition, Enbridge advised that through the course of its engagement program, it came to understand that the health of the Qu'Appelle Valley watershed was of importance to the eight Aboriginal groups situated within or along the valley. Enbridge worked proactively with the interested Aboriginal groups to start a water stewardship initiative in August 2015 whereby Enbridge and the Aboriginal groups would collaborate on initiatives aimed at improving the long-term viability and sustainability of the valley.

Enbridge submitted that, as is consistent with its Aboriginal engagement program, it will continue to engage with Aboriginal groups on an ongoing basis, throughout the life cycle of the Project. To the extent that site-specific impacts are identified in relation to either the construction or operation of the Project, Enbridge expressed that it will work with Aboriginal groups to determine appropriate avoidance or mitigation measures.

Enbridge noted that, the recommendations set out in the two expert reports filed by AMC identified a multi-stakeholder Oversight Committee as potentially desirable; however, AMC did not endorse these expert recommendations. Enbridge indicated that it had raised the potential establishment of an Elder's Advisory Committee with AMC, but AMC had not expressed any interest.

Enbridge indicated that it does not perceive a gap in its engagement about integrity management, emergency management, or environmental protection, nor does it perceive any lack of oversight from the NEB. For these reasons, Enbridge submitted that a community-based, multi-stakeholder Oversight Committee is not necessary for this Project.

Views of the Board

In assessing the consultation undertaken by Enbridge with Aboriginal groups potentially affected by the Project, the Board evaluated the design and implementation of Enbridge's consultation activities. The Board considered Enbridge's activities to consult Aboriginal groups and to learn about their concerns and interests. The Board also considered how Aboriginal groups responded to opportunities for consultation and how Enbridge sought to understand, consider and address the concerns of potentially-affected Aboriginal groups. The Board considered how this input influenced the Project's proposed design and operation. The Board also considered the concerns and views expressed by Aboriginal groups.

A company's early consultation with Aboriginal groups is a critical part of the development of a proposed project, and a key matter for consideration within the regulatory assessment process. Timely, accessible and inclusive consultation facilitates the effective exchange of information and provides opportunities for the company to learn about the concerns of potentially affected Aboriginal groups, to discuss how those concerns can be addressed through project design and operational considerations, and to develop and discuss measures to reduce and mitigate the effects a project may have on the interests of Aboriginal groups. Timely and effective consultation can help establish productive relationships that can carry on throughout the life of the project. It also informs the Board of the concerns Aboriginal groups may have about the Project's impacts.

The Board is of the view that the design of Enbridge's Aboriginal consultation program, including the process to identify potentially affected Aboriginal groups, was appropriate given the scope and the nature of the Project and that it meets the requirements and expectations set out in the Board's Filing Manual. The Board notes that based on the Aboriginal groups identified by the Board and the Government of Canada, Enbridge expanded its initial Aboriginal consultation program to include a total of 145 Aboriginal groups and organizations, which included Aboriginal communities with Reserve lands located over 200 km from the pipeline route.

The Board also finds the implementation of Enbridge's consultation program to be sufficient. The Board acknowledges that while several Aboriginal groups were satisfied with Enbridge's consultation process for this Project, several groups were also critical of Enbridge's approach to consultation or the timeliness of consultation activities. In the Board's view, all potentially affected Aboriginal groups were provided with sufficient information about the Project and had the opportunity to make their views about the Project known to Enbridge, which Enbridge reported to the Board, or to the Board directly through the Board's hearing process.

Through the hearing process, the Board received a variety of information from Aboriginal groups about Enbridge's consultation and the potential impacts of the Project, all of which the Board considered. This includes traditional land and resource use information provided to the Board by Aboriginal groups, which is discussed in Section 6.4 of this Chapter, as well as in the Board's environmental assessment of the

Project presented in Chapter 7 of this Report. To the extent that site-specific impacts are identified in relation to either the construction or operation of the Project, the Board notes that Enbridge will work with Aboriginal groups to determine appropriate avoidance or mitigation measures.

The Board received evidence from Aboriginal groups on the importance of building meaningful, healthy relationships and partnerships that are renewed regularly. Although the Board considers Enbridge's consultation with Aboriginal groups on the Project to have been sufficient to date, and recognizes Enbridge's commitment to continue to consult potentially affected Aboriginal groups throughout the life of the Project, the Board believes that more can be done going forward to enhance relationships and ensure effective, ongoing consultation in the future. The Board believes there is an important opportunity at this juncture for Enbridge to renew and, in some cases, improve its relationship with Aboriginal groups.

Accordingly, the Board imposes the following conditions: **Certificate Condition 11, Section 58 Order Condition 10,** and **Decommissioning Order Condition 8,** which require Enbridge to file reports summarizing its consultations with all potentially affected Aboriginal groups until construction of the Line 3 Replacement Pipeline has been completed, or Decommissioning Activities have been completed, as applicable. The Board confirms that reporting pursuant to these Conditions will replace Enbridge's reporting of periodic updates to its Aboriginal Consultation Logs, which Enbridge had been providing on a quarterly basis and committed to providing on a semi-annual basis once construction has commenced. However, the Board notes Enbridge's commitment to making the Aboriginal Consultation Logs available to the Board if requested.

Certificate Condition 29, Section 58 Order Condition 21, and **Decommissioning Order Condition 14** require Enbridge to file a plan(s) for consultation with Aboriginal groups during the operational phase of the Line 3 Replacement Pipeline and during the Decommissioned Period for the Decommissioned Line 3 Pipeline, as applicable. These plans are to be developed in consultation with Aboriginal groups and are to reflect a collaborative and coordinated consultation approach, as opposed to only information sharing. This means that Enbridge must demonstrably respond to and address concerns raised where reasonable. The plans should also respect the cultural interests of Aboriginal groups regardless of the nature of the land use in the Project area (for example, unoccupied Crown land, occupied Crown land, or privately owned land). Enbridge and participating Aboriginal groups are encouraged to be innovative in order to enhance the way consultation will occur during the operational phase of the Line 3 Replacement Pipeline and during the Decommissioned Period.

Enbridge is further required, five years after commencing operation of the Line 3 Replacement Pipeline and five years after completing Decommissioning Activities, to file a report summarizing the outcomes of the consultation plans, assessing their overall effectiveness, and summarizing changes or improvements that have been made to the plans **(Certificate Condition 37, Section 58 Order Condition 30** and **Decommissioning Order Condition 19)**.

In satisfying the above conditions, and generally, the Board expects Enbridge to continue to consult throughout the lifecycle of the Project. Enbridge should engage in ongoing dialogue and meaningfully consider and address information and concerns brought forward by Aboriginal groups in the future. This includes traditional land use information that may be provided to Enbridge after the Board's hearing process.

6.4 Potential Impacts of the Project on Aboriginal People

Views of Enbridge

Enbridge submitted that it has 68 years of operational experience in the Project corridor, which currently contains up to six Enbridge pipelines. Approximately 99.5% of the land required for the Project is either privately-held or occupied Crown land, predominantly under cultivation. Enbridge solicited information about Aboriginal traditional practices in the same corridor in 2008-2009 both through engagement and traditional use studies as part of the Alberta Clipper Expansion Project. Notwithstanding these circumstances, Enbridge indicated that it has made significant efforts to ensure Aboriginal groups had a meaningful opportunity to identify Project-specific impacts, including by having agreed to fund 20 traditional land and resource use studies and having had meaningful negotiations with at least an additional seven Aboriginal groups about such studies. Enbridge indicated that, although it does not believe that traditional land and resource studies were required in the circumstances, it negotiated funding for such studies based on community priorities.

In addition, Enbridge indicated that ongoing engagement with Aboriginal groups will continue to be a key information source used to confirm the identified potential effects on traditional land and resource use.

Enbridge submitted that, through its ongoing engagement program, it is working with Aboriginal groups to seek out local and traditional knowledge in order to understand and assess current traditional land use along the RoW, in order to avoid potential impact on traditional resource use. Enbridge indicated that it seeks out such knowledge from individuals who are made available to Enbridge by Aboriginal communities, including Elders and resource users.

Enbridge indicated that the proposed Line 3 Replacement Pipeline route was designed to, as much as possible, be alongside and contiguous to an existing Enbridge pipeline RoW that is within lands that are predominantly privately held, rather than on Crown land. Enbridge further submitted that the current land tenure and land use along the RoW would appear to preclude the possibility of traditional activities being practiced on the majority of the proposed Project area.

Enbridge submitted that the environmental and cultural concerns that have been shared are overwhelmingly not site-specific and principally relate to the potential impacts of a speculative release event. Enbridge advised that while such concerns are important, they are best addressed through awareness and education about pipeline safety, integrity, and emergency response. Enbridge indicated that it is providing such education through its ongoing and robust engagement process.

Views of Participants

Support for the Project

Several Aboriginal groups expressed support for the Project. Sweetgrass First Nation (Sweetgrass) stated that it had no concerns related to the Project and that it supports the construction and operation of the Project. Moosomin expressed support for the Project based on the economic opportunities it presents. George Gordon expressed support for the Project and noted that it has entered into discussions with Enbridge regarding the role it will play in executing stewardship during the construction, decommissioning and operations of the Project. SCO stated that it has already benefitted from its relationship with Enbridge and that it views the Project as an opportunity to develop an economic engine for its community in the longer term.

Lack of Traditional Environmental Knowledge (TEK) and Traditional Land Use (TLU) Information

Several Aboriginal groups expressed concerns over Enbridge's approach to gathering traditional knowledge on land and resource use for the Project. AMC submitted that the undervaluing of TEK permeates Enbridge's filing with respect to the proposed Project. AMC commented on the high number of TLU studies that remain outstanding at the close of the hearing and concluded that the information provided by Aboriginal groups played little to no part in Enbridge's Application. Ochapowace submitted that Enbridge does not provide a definition of traditional knowledge nor does it provide specific protocols followed in its attempts to gather traditional knowledge. Ochapowace further indicated that Enbridge has not provided information on how it has collected or incorporated traditional knowledge into the Project.

Peguis disagreed with Enbridge's conclusions that formal Traditional Land and Resource Use (TLRU) studies are not necessary for most of the Line 3 Replacement Pipeline route, since the current land tenure and land use preclude, to a large extent, the practice of traditional activities on the lands in question. Peguis submitted that Enbridge has not conducted the necessary investigations or consultations to identify with confidence the potential impacts of the Project on TLU.

Beaver Lake Cree Nation (Beaver Lake), Ocean Man, Ermineskin Cree Nation (Ermineskin), Sweetgrass and Siksika Nation (Beaver Lake et al.) expressed concern that the lack of baseline TLRU data is not adequately justified and substantiated and that Enbridge has provided no references to consultation and information gathering with any specific Aboriginal groups regarding TLRU data beyond meetings with residents of Swan Lake Indian Reserve No. 7.

Beaver Lake et al. indicated that there is no specific evidence that Traditional Knowledge was incorporated into any stage of the Project ESA, beyond the inclusion of Sweetgrass elders in the Aboriginal Environmental Inclusion Strategy and that this report is unavailable.

Manitoba Métis Federation (MMF) submitted that there is ongoing Métis land use and occupancy within and adjacent to Enbridge's RoW. MMF indicated that Enbridge's failure to acknowledge fully the Métis presence in the area through which the Project passes has led to a failure to evaluate the potential effects of the Project on Métis health and socio-economic

conditions, physical and cultural heritage, TLU, and, ultimately, rights, claims, and interests. MMF further submitted that additional work is needed in order to review and assess potential impacts based on the information gathered.

Two Aboriginal groups, Piikani and Canupawakpa Dakota Nation (Canupawakpa), indicated that by the time they reached an agreement with Enbridge and received available resources, they did not have enough time to complete their Traditional Knowledge Studies before the deadline to submit written evidence. Piikani specifically indicated that it has both Aboriginal and Treaty rights within the Project area and that the Project is located within its traditional territory but its position and concerns have not been fully ascertained because, as of the close of the record, it was still awaiting the completion of its Traditional Knowledge Study.

Protection for Historical and Archeological Artifacts

AWNTB submitted that the Project RoW falls within its traditional lands, which are still being used yearly and seasonally for subsistence or spiritual purposes. It submitted that the Project will impact and potentially damage or destroy sites of archaeological, cultural, spiritual and historical importance or interest along the RoW, including some spiritual sites, ceremonial sites, historic camps and burials.

Ochapowace expressed that it would like assurance that Enbridge will protect, document and archive any and all historical artifacts that are located within both the original corridor and the proposed corridor and share with it this information. Samson also expressed concerns that Enbridge follow appropriate protocol to protect and preserve its historic archeological resources, which may be discovered during the construction and operation of the Line 3 Replacement Pipeline. Samson identified several specific sites of historical significance, including the historic Bison Pound.

AMC also expressed concerns about how, in the event of unforeseen heritage resource discoveries, the Aboriginal groups and other Indigenous peoples will be notified of the discovery, and involved in and subsequently notified of the mitigation plan. AMC also expressed concern about how it will be notified in the event other contingency plans are enacted.

Traditional and Cultural Activities

Several Aboriginal groups expressed concerns about potential negative impacts of the Project on their traditional activities such as hunting, gathering traditional plants and cultural practices. Onion Lake Cree Nation (Onion Lake) indicated that it used the Project area for hunting, gathering medicinal plants and spiritual and cultural practices. MMF noted that harvesting is a way that it expresses its Métis heritage and identity. In addition to the importance of providing a level of sustenance, harvesting with family and friends who are also Métis was noted as an important part of harvesting activities. Samson expressed concerns regarding the impacts of the Project on medicinal, ceremonial and traditional food plants.

Beaver Lake et al. submitted that the range of potential impacts to cultural well-being considered by Enbridge is inadequate. Beaver Lake et al. expressed concerns that Enbridge did not demonstrate that it has properly considered other potential cultural impacts, or provided justification as to why they were not assessed. Furthermore, Enbridge did not provide sufficient

evidence of information gathering to support its claim that no concerns regarding impacts to cultural well-being were identified.

Peguis submitted that Enbridge has not adequately investigated its concerns relating to the impacts of the Project on plants it relies upon. Further, Peguis submitted the extent of the impacts of the Project cannot be assessed in a meaningful fashion based on the information that is presently before the Board. In Peguis' view, further measures are required to ensure that the adverse effects of the Project on traditional land use of plants by Peguis are avoided, mitigated or off-set.

Impacts of Contamination and Potential Spills on Traditional Use and Resources
Peguis submitted that its members are concerned about the downstream effects from a spill from the Project. Peguis also expressed concerns about the manner in which adverse environmental effects from a spill may affect lands and waters outside of the immediate Project footprint, including lands that may not be private.

Pine Creek submitted that it has concerns regarding how the Project might potentially impact water either through contamination or through access to that water. Samson expressed concern about impacts to water quality, HDD drilling, impacts to medicines grown in and near the water and the impacts of potential spills.

MMF indicated that it has concerns related to the human health effects of the Project, especially on smaller, more remote communities. It submitted that its members had fears surrounding the contamination of water, animals and soil as a result of spills, accidents, or malfunctions of the pipeline system. MMF indicated that ultimately it would be humans who consume or utilize these resources and that the ability to detect spills or leaks before they had an impact on human health and country foods consumed by Métis citizens was a major concern.

Beaver Lake et al. submitted that Enbridge's statement that "no issues or concerns specifically related to human health were identified" is inadequately substantiated.

Taking-up of Traditional Lands
Michel submitted that there has been no analysis or consideration by Enbridge on the implications of removing unoccupied Crown lands or other lands from the inventory of lands over which Michel has treaty and Aboriginal rights. Stoney Tribal Association indicated that it is important to take into account the importance of land to Aboriginal peoples when considering adverse effects of taking-up traditional lands.

Use of Private Lands for TLRU
Peguis disagreed with Enbridge's conclusions that private land tenure does not permit traditional land use activities by Peguis members to take place. Peguis indicated that its traditional rights and use can be compromised even though the Project is primarily on private land. Peguis submitted that it still exercises Treaty and Aboriginal rights on private land, with permission to do so, whether it be hunting, gathering, or fishing, and harvesting of plants, berries or medicines. Peguis also asserted that there may be impacts of the Project on private lands where Peguis may not directly access the lands, such as the availability of wildlife for harvesting or other traditional

land use activities in areas near to or adjacent to the private lands that will be impacted by the Project.

Monitoring

Some Aboriginal groups raised concerns about how they could be assured of involvement with and notification of potential environmental issues through construction and operation of the Project. AMC expressed concerns regarding notification, engagement and transparency. It questioned how Aboriginal groups and other Indigenous peoples, stakeholders and broader members of the community will be both notified of any unforeseen environmental issues and engaged in the resolution. Pine Creek expressed concerns about being kept informed as to the details of contingency plans to prevent or remediate contamination by product spills once the Project is operational.

Several Aboriginal groups requested that they be actively involved in monitoring activities. AMC indicated that it would like Enbridge to develop and implement more robust monitoring with respect to spills, taking into account input from peer reviewers, the Elders & Knowledge Holders, and guidance from current provincial practice. Samson indicated that it would like to be involved in environmental and biodiversity monitoring, integrated land management, construction monitoring, archeological monitoring and long-term training and educational opportunities. Pasqua First Nation (Pasqua) requested that the Board condition any approval to require it and Enbridge to establish an environmental monitoring and protection plan for the Qu'Appelle Valley and that the environmental monitoring and protection plan be satisfactory to both Pasqua and Enbridge.

AMC also provided a number of specific recommendations for strengthening the monitoring regime: augmenting the Emergency Planning & Spill Response; employing Aboriginal groups and other Indigenous peoples as community liaisons; developing and maintaining a Project specific website, including a requirement for annual reporting; requiring the proponent to fund an independently-led ex-post (or post hoc) evaluation and developing robust monitoring programs.

Additional information on concerns raised by Aboriginal groups is provided in Chapters 3, 4, 7 and 8.

Reply of Enbridge

Lack of TEK and TLU Information

Enbridge submitted that it has not confirmed any Project-specific impacts on Aboriginal traditional practices despite a rigorous engagement program. Enbridge also indicated that no Aboriginal group has raised a concern or potential impact to Aboriginal or Treaty rights that has required a change to the Project route or design. Enbridge advised that it will evaluate avoidance and mitigation measures if new information becomes available through traditional land use studies and ongoing engagement.

Enbridge submitted that it completed an assessment of TLRU as part of the ESA for the Project. At the time the ESA was written, few specific details regarding TLRU were available. However, Enbridge indicated that the assessment considered that traditional land use activities may yet be identified. Potential effects were considered and assessed in the ESA, including potential effects

to traditional harvesting sites, cultural sites and trails and travelways. Enbridge identified an example of how traditional knowledge was used in the assessment where wildlife and wildlife habitat were identified as important resources for medicinal and spiritual purposes. Enbridge submitted that the assessment concluded that with the implementation of the mitigation measures proposed by Enbridge, the effects on TLRU would be of medium magnitude, low probability, short-term duration and reversible, and therefore, not significant.

Enbridge noted that the proposed route for this Project follows a long-established existing utility corridor that contains up to six Enbridge pipelines. Enbridge submitted that it has over 60 years of operational experience in this corridor. Enbridge also indicated that the current land tenure and land use preclude, to a large extent, the practice of traditional activities as approximately 99.5% of the land required for the Project is either privately-held or occupied Crown land, predominantly under cultivation.

In addition, Enbridge submitted that is has been engaging with Aboriginal groups for several months and offered to support Traditional Use Studies specific to the Project, but that no Traditional Use Studies had been completed up to the end of November 2015. Enbridge submitted that it will continue to engage the Aboriginal groups according to their interest and availability, and will consider any traditional use information they wish to provide. Enbridge stated that while it recognizes the desire of Aboriginal groups to complete traditional use studies, new traditional land use studies are not required to assess the potential impacts of the Line 3 Replacement Program, in particular given the current land tenure and land uses along the RoW.

Enbridge submitted that it is committed to ensuring that information that is provided by Aboriginal groups (general or specific) is respectfully considered, formally responded to and directed to the appropriate business unit for consideration. For example, Enbridge indicated that sites of interest or concern that are proximate or adjacent to the RoW have been forwarded along to Enbridge's Environment and Construction groups for consideration of mitigation or avoidance strategies. Enbridge advised that this information will also be provided to Enbridge's Risk Management groups to be considered for dispersion modeling and in emergency response plan development.

Protection for Historical and Archeological Artifacts

Enbridge submitted that the archaeological assessments on the Project footprint began in fall 2014 and will continue through 2015 and possibly into 2016. Enbridge indicated that it identified 41 previously recorded sites via consultation with the relevant provincial regulatory agencies. Enbridge noted that it did not use input from Traditional Knowledge during the initial site identification. However, Enbridge expressed that Traditional Knowledge has been collected through its Aboriginal engagement program and when heritage or archaeological sites are identified, they will be investigated, assessed, and appropriate mitigation will be implemented. To date, only one specific site has been noted during the engagement program. Enbridge pointed out that a burial site was reported in Saskatchewan, but upon investigation, it was determined to be located outside of the Project Footprint and Enbridge confirmed that the site would not be impacted by construction.

Enbridge indicated that field studies were completed in the summer of 2015 along the length of the Line 3 Replacement Pipeline route and reports are currently being prepared to be submitted

to the appropriate provincial bodies. Enbridge expressed that, upon request, it could provide copies to interested Aboriginal groups after the reports are submitted and accepted.

Enbridge provided a site-by-site analysis of each of the cultural sites identified by Samson. Enbridge submitted that these sites have been included in Alberta Culture and Tourism's Listing of Historic Resources indicating that some of the sites "contain a known and significant historic resource that is of great significance and will require avoidance or assessment". Enbridge concluded that there are no developments planned in association with the Project that would impact the sites identified by Samson, including the historic Bison Pound.

Traditional and Cultural Activities
Enbridge indicated that, while no specific issues were raised pertaining to wildlife for traditional economic importance used as country foods, general concerns were raised pertaining to the protection of wildlife habitat. In specific response to an IR issued by AMC, Enbridge stated all participating "Manitoban First Nations had and will continue to have the opportunity to identify wildlife of traditional economic importance for country food".

Enbridge submitted that during its Aboriginal consultation, groups identified important hunting areas in the vicinity of Salmon Lake, south of the Hardisty Terminal in Alberta, and expressed concerns regarding wildlife sustainability locally and regionally. In addition, wildlife and wildlife habitat were identified as being important for medicinal and spiritual purposes. Since preparing its original ESA, Enbridge submitted that during its engagement activities with Aboriginal groups, similar interest, concerns and traditional knowledge relating to wildlife or wildlife habitat including considerations for future hunting usage during Project planning and changes in wildlife movement, community composition and wildlife habitat at local and regional scales were identified.

Through its ongoing engagement program, Enbridge submitted that it will continue to identify issues or concerns, including future concerns, by Aboriginal groups about traditional land uses like fishing, hunting and plant gathering. Enbridge indicated that it invites all Aboriginal groups to make any such issues or concerns known to Enbridge through the ongoing engagement process, such that avoidance and mitigation measures, as appropriate, may be considered.

Impacts of Contamination and Potential Spills on Traditional Use and Resources
Enbridge submitted that, through its ongoing Aboriginal engagement program and the Traditional Use Studies that it has supported to date, Aboriginal groups have had the opportunity to identify any potential project impacts, including potential project health related impacts. Enbridge indicated that the only direct Project health related impacts identified by Aboriginal groups are those that would be potentially created through a release event. Enbridge committed to continuing to work with Aboriginal groups to understand these potential concerns to ensure any potential human health impacts arising from construction or operations are minimized.

Enbridge submitted that consideration was given to the human health impacts of the loss of traditional medicinal plants in terms of the contamination of country foods in the event of an accident or malfunction.

Enbridge expressed that it has multiple mitigation measures and contingency plans in place to address the unlikely event of a spill. It noted that most spills are small in nature and extent and can be readily mitigated by implementing the appropriate mitigation measures and contingency plans.

Taking-up of Traditional Lands
Enbridge submitted that 16% of all lands within Treaty 6 are not "taken up" through land tenure or "Exclusion Zone", so they are available to be used for traditional purposes by Aboriginal groups. However, Enbridge indicated, 99% of the lands within the Project Local Study Area (LSA) and the Project RSA are unavailable for such purposes, because they consist of privately-tenured lands, occupied Crown lands, or they are within a 183 meter-wide Exclusion Zone. Enbridge commented that such a result is not surprising given the historical use of the impacted lands over decades, including for pipelines.

Enbridge submitted that it had not received any information that indicates that any member of Michel uses unoccupied Crown land along the pipeline route for traditional purposes, or that any traditional activities may be disturbed by the Project. Enbridge stated that the land along the Line 3 Replacement Pipeline's route has long been unavailable for such purposes. Enbridge concluded that no appreciable adverse effect on Michel's ability to exercise its asserted rights will result from the Project.

Enbridge submitted a table and maps that set out the Crown lands, both occupied and unoccupied, along the entire Project route. Enbridge stated that it has received no information to indicate that any of these Crown lands are being used by Aboriginal groups for traditional activities. Enbridge noted that, for the purpose of conducting its ESA, it was assumed that traditional activities are being conducted on lands along the Line 3 Replacement Pipeline route.

Use of Private Lands for TLRU
Enbridge also submitted that the current land tenure and land use preclude, to a large extent, the practice of traditional activities as approximately 99.5% of the land required for the Project is either privately-held or occupied Crown land, predominantly under cultivation. Therefore, Enbridge expressed there is little opportunity for Aboriginal groups to exercise harvesting rights on impacted lands.

Through its engagement program, Enbridge submitted that it asked potentially affected private landowners about access to their lands by Aboriginal groups. Only four private landowners advised Enbridge that Aboriginal groups had been granted access to their lands. No impact on traditional uses on the lands of those four landowners has been identified. No private landowners identified any unauthorized traditional land use activities, including hunting or fishing on their lands.

Monitoring

Enbridge submitted that the role traditional knowledge will play in ongoing monitoring will be dependent on the results of Enbridge's continuing engagement activities. Enbridge confirmed that Aboriginal traditional knowledge will be used to support ongoing monitoring of Project effects where appropriate. Enbridge also submitted that it is currently working closely with Aboriginal groups to acquire traditional knowledge and land use information along the proposed Line 3 Replacement Pipeline RoW as an enhancement to existing environmental protection measures.

Enbridge indicated that environmental and construction monitoring positions perform a very important role on the construction of the Line 3 Replacement Pipeline. Enbridge also submitted that the monitors need training to be qualified to act as monitors and, in some cases, they need expert scientific training. Enbridge expressed that the purpose of monitors is to ensure that the commitments in the environmental protection plan are being met. In addition, Enbridge indicated there may be some Aboriginal monitors on the Project and it has already engaged in discussion about training Aboriginal peoples for some of these positions. However, Enbridge expressed concern that it would not be feasible to include all Aboriginal groups it consulted in monitoring while still ensuring safe and efficient construction of the Project.

As an alternative, Enbridge proposed to develop an Aboriginal Construction and Reclamation Observation Plan that will allow Aboriginal groups to see what is going on in the Project through participation in construction site visits to be held prior to ground disturbance, during construction and post-construction.

Views of the Board

In assessing the Project's potential impacts on Aboriginal interests, the Board considered all of the evidence provided. The Board assessed how Enbridge identified and evaluated the Project's potential impacts, the concerns raised by Aboriginal groups, and the measures Enbridge has proposed to mitigate those impacts.

The Board notes that, to minimize Project impacts, the proposed Line 3 Replacement Pipeline route was designed, as much as possible, to be alongside and contiguous to an existing Enbridge pipeline RoW. However, the Board notes the importance of considering the potential impacts of the Project on Aboriginal interests, including TLRU, when available. Aboriginal groups stressed to the Board the fundamental importance of the land, water and natural resources to the history, identity and spirituality of Aboriginal peoples - if harm is caused, it would significantly impact their well-being and cultural identity.

The Board recognizes the differing views between some Aboriginal groups and Enbridge concerning the appropriateness of Enbridge's approach to gathering traditional knowledge, and information about TLRU. This includes dissatisfaction on the part of some Aboriginal groups with the length of time it took to reach an agreement with Enbridge regarding support for Traditional Knowledge Studies and how this negatively impacted the ability of some groups to participate in the hearing process.

The Board considered all of the evidence and concerns regarding impacts on TLRU presented by participating Aboriginal groups, including the detailed site-specific information provided by some Aboriginal groups; the information presented concerning sites of spiritual and historic importance, such as the Bison Pound; and the submissions regarding the importance of ongoing involvement of Aboriginal groups if the Project is approved. The Board also carefully examined Enbridge's responses to these concerns, including its commitment to use best practices and standard mitigation measures to reduce impacts to the environment and to TLRU, and to continue to work with Aboriginal groups to complete TLU investigations to identify any additional impacts or concerns.

In light of the evidence the Board heard during the hearing, it imposes the following conditions (in addition to those discussed in Section 6.4 above): **Certificate Condition 10, Section 58 Order Condition 7,** and **Decommissioning Order Conditions 10** and **11** require Enbridge to file plans to address outstanding TLU investigations for the Project. Enbridge must, as part of these plans, provide a summary of any effects of the Project on the current use of lands and resources for traditional purposes that are identified in the investigations, and a description of any outstanding concerns and how they have been or will be addressed by Enbridge.

Certificate Condition 12, requires Enbridge to file a plan describing participation of Aboriginal groups in monitoring during construction of the Line 3 Replacement Pipeline.The Board appreciates Enbridge's concern that it cannot hire approximately 150 Aboriginal monitors for the Project while ensuring safety and efficiency. While the Board does not expect Enbridge to hire 150 monitors, there is a reasonable middle ground. The Board expects Enbridge to make efforts to accommodate active monitoring where desired by an Aboriginal group and where reasonable and safe. While observational site visits may be a component of the Plan, the Board expects the Plan to be more fulsome than this single component. If an Aboriginal group wishes to participate in monitoring and Enbridge cannot reasonably accommodate the request, Enbridge will be expected to provide an explanation to the Board as to why.

The Board also imposes a condition requiring Enbridge to file with the Board and post on its Project website a Commitments Tracking Table prior to construction of the Line 3 Replacement Pipeline, and to maintain a current copy at its construction offices. **(Certificate Condition 14** and **Section 58 Order Condition 11)**.

The Board is of the view that with the implementation of Enbridge's environmental protection procedures and mitigation measures, Enbridge's commitments to address impacts to the traditional use of land and resources, and the inclusion of the Board's conditions, any potential Project impacts on Aboriginal rights and interests are likely to be minimal and will be appropriately mitigated. See Chapter 7, specifically Section 7.4.3.5.2 for further details.

Chapter 7

Environmental Assessment

Since the Project includes construction and operation of a pipeline over 40 km in length, it is a designated project under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). The NEB, as the responsible authority under CEAA 2012, is required to ensure that an environmental assessment (EA) is conducted and an EA report is prepared. The Board also considers environmental protection as part of its broader mandate. When making a recommendation or decision on a Project, the Board is responsible for assessing the environmental and socio-economic effects of the Project. This chapter represents the NEB's EA.

7.1 The CEAA 2012 Context

The Board posted a Notice of Commencement on the Canadian Environmental Assessment Registry Internet Site (CEARIS) on 19 February 2015 and its reference number is 80091. On 4 May 2015, the Board posted on the CEARIS a description of the factors to be taken into account in the EA and the scope of those factors as required by subsections 19(1) and 19(2) of CEAA 2012. The environmental effects considered include those listed in subsection 5(1) of CEAA 2012 as well as other effects pursuant to subsection 5(2) of CEAA 2012 and those set out in the NEB's Filing Manual. For brevity, where the terms *environmental effects* or *environmental issues* are used in this Chapter, they refer to environmental as well as socio-economic effects or issues.

7.2 The Board's Environmental Assessment Methodology

In assessing the environmental effects of the Project, the NEB used an issue-based approach as set out in the NEB's Filing Manual.

The Board has conducted separate effects assessments for the construction and operation of the Line 3 Replacement Pipeline (Section 7.4) and the decommissioning of the Existing Line 3 Pipeline (Section 7.5), due to the differences in activities, Project-environment interactions and predicted effects expected as a result of each of these Project components.

The environmental issues and concerns raised by Participants in the hearing are outlined in Section 7.3, and were considered by the Board when conducting its EA.

Each effects assessment begins with a description of the relevant Project component and the activities to be conducted as part of that component, followed by a description of the setting and the environmental and socio-economic elements within that setting. Based on this information, the NEB identified Project-environment interactions expected to occur and any resulting potential adverse environmental effects. If there were no expected Project-environment interactions or interactions resulted in positive or neutral effects, then no further examination was deemed necessary.

The NEB assessed the potential adverse environmental effects and the adequacy of Enbridge's proposed environmental protection strategies and mitigation measures for each of the Line 3 Replacement Pipeline and the decommissioning of the Existing Line 3 Pipeline. First, any standard measures relied on by Enbridge to mitigate potential adverse effects are discussed. Second, where there are outstanding issues regarding key environmental elements, or where Enbridge's proposed mitigation may not be sufficient, detailed analyses is provided. The Board assessed whether further mitigation is required by way of conditions on any potential Project authorization.

Where any residual effects remain after proposed mitigation, the Board considered cumulative effects for the Project (Section 7.6). The Board then discusses follow-up under CEAA 2012 (Section 7.7) and provides its determination of significance for the Project in Section 7.8.

7.3 Environmental Issues Raised by Participants

The Board received a number of submissions from Participants that raised particular concerns related to environmental issues associated with the Project. Table 7-1 lists the environmental issues raised by Participants.

Table 7-1 - Environmental Issues Raised By Participants

Participant	Environmental Issue(s) Raised
Intervenors	
Asini Wachi Nehiyawak Traditional Band	▪ Effects to traditional land and resource use ▪ Effects to heritage resources/cultural sites ▪ Involvement in field programs ▪ Incorporation of traditional knowledge into the EA
Assembly of Manitoba Chiefs	▪ Incorporation of traditional knowledge into EA ▪ Cumulative effects assessment ▪ Effects of spills on water resources ▪ Monitoring, follow-up and adaptive management
Dakota Tipi First Nation	▪ Involvement in environmental monitoring ▪ Effects to traditional land and resource use
File Hills Qu'Appelle Tribal Council	▪ Effects of spills on water resources ▪ Involvement in environmental monitoring ▪ Effects to heritage resources/cultural sites ▪ Effects to traditional land and resource use
George Gordon First Nation	▪ Historical contamination ▪ Effects to traditional land and resource use ▪ Waste management ▪ Clubroot

Participant	Environmental Issue(s) Raised
Keeseekoose First Nation	▪ Incorporation of traditional knowledge in EA ▪ Historical contamination ▪ Effects to traditional land and resource use ▪ Involvement in environmental monitoring
Manitoba Government	▪ Effects resulting from open cut watercourse crossings ▪ Effects to water resources, including from spills ▪ Clubroot
Manitoba Metis Federation	▪ Effects to traditional land and resource use ▪ Incorporation of traditional knowledge into EA ▪ Effects to human health ▪ Effects to socio-economic conditions ▪ Effects to heritage resources/cultural sites ▪ Effects of decommissioning the Existing Line 3 Pipeline ▪ Cumulative effects ▪ Involvement in environmental monitoring
Michel First Nation	▪ Incorporation of traditional knowledge into the EA ▪ Effects to traditional land and resource use ▪ Effects to health and socio-economic conditions ▪ Effects to heritage resources/cultural sites ▪ Effects of decommissioning the Existing Line 3 Pipeline ▪ Involvement in development/execution of Environmental Protection Program ▪ EA methodology
Mosquito-Grizzly Bear's Head-Leanman Assiniboine Nation	▪ Effects to traditional land and resource use ▪ Incorporation of traditional knowledge into the EA ▪ Involvement in field programs
Natural Resources Canada	▪ Effects of spills to drinking water
Ochapowace Nation	▪ Historical contamination ▪ Incorporation of traditional knowledge into the EA ▪ Effects to heritage resources/cultural sites ▪ Involvement in environmental monitoring ▪ Effects of spills, accidents and malfunctions, especially to water resources
Pasqua First Nation	▪ Effects to surface and groundwater resources ▪ Ground settling in K&S potash mine footprint area ▪ Involvement in environmental monitoring ▪ Effects of spills

Participant	Environmental Issue(s) Raised
Peguis First Nation	▪ Effects of spills, accidents and malfunctions ▪ Effects to traditional land and resource use ▪ Incorporation of traditional knowledge into EA ▪ Involvement in environmental monitoring
Piikani First Nation	▪ Effects to heritage resources/cultural sites ▪ Effects to traditional land and resource use ▪ Effects to health and socio-economic conditions ▪ Involvement in environmental monitoring
Pine Creek First Nation	▪ Effects to traditional land and resource use, especially water resources ▪ Involvement in environmental monitoring ▪ Effects of spills
Roseau River Anishinabe First Nation	▪ Effects to traditional land and resource use
Samson Cree Nation	▪ Effects to heritage resources/cultural sites ▪ Effects to water resources, wetlands, air quality, wildlife and aquatic species ▪ Effects to traditional land and resource use ▪ Incorporation of traditional knowledge into the EA ▪ Effects to human health ▪ Involvement in environmental monitoring ▪ Effects of spills, accidents and malfunctions
Stewart Crone	▪ Effects of the Decommissioned Line 3 Pipeline on future land use ▪ Routing of the Line 3 Replacement Pipeline
Stoney Tribal Administration	▪ Effects to traditional land and resource use
Treaty 2 Territorial Alliance	▪ Effects to traditional land and resource use ▪ Involvement in environmental monitoring ▪ Effects to wildlife and wildlife habitat
Beaver Lake Cree Nation Sweetgrass First Nation Ermineskin Cree Nation Ocean Man First Nation Siksika Nation #430 (Shared Written Evidence)	▪ Effects to traditional land and resource use ▪ Incorporation of traditional knowledge into EA ▪ Effects to social and cultural well-being ▪ Effects to human health ▪ EA methodology, including cumulative effects assessment
Moosomin First Nation Kahkewistahaw First Nation (Shared Written Evidence)	▪ Effects of spills ▪ Involvement in environmental monitoring

Participant	Environmental Issue(s) Raised
Commenters	
Environment and Climate Change Canada	▪ Migratory birds ▪ Wetlands ▪ Species at risk
Health Canada	▪ Effects to human health (air quality, noise, spills)
Onion Lake Cree Nation	▪ Effects to traditional land and resource use ▪ Effects of spills to wildlife and fish, their habitats, and water quality

7.4 Effects Assessment - Line 3 Replacement Pipeline

This Section presents the Board's assessment of the effects of the physical activities that would be carried out by Enbridge to construct and operate the Line 3 Replacement Pipeline. This includes all Project components applied for by Enbridge under sections 52 and 58 of the NEB Act.

7.4.1 Project Components and Activities

While Chapter 1 of this Report provides a general description of the Project, Table 7-2 provides further detail regarding the specific Project components and activities that are relevant to the effects assessment for the construction and operation of the Line 3 Replacement Pipeline.

Table 7-2 - Project Components and Activities - Line 3 Replacement Pipeline

Project Components and Activities
Construction Phase – Timeframe: from late Q1 or Q2 2016 for new pump stations, new tanks and related facilities and from Q3 2016 for the pipeline. Construction is expected to take approximately 15 months.
• The total footprint would be about 5,685 ha (construction RoW, permanent facilities, temporary facilities, and all temporary workspace).
Pump Stations: • Construction of new pumps, variable frequency drives and pressure control valves at 16 existing Enbridge mainline corridor pump stations, sending and receiving traps at select stations, and associated interconnection work. Work will be within existing station boundaries, and will be mainly on previously disturbed land with some work on undisturbed land. • Construction of two new pump stations and associated infrastructure (West Milden and Richardson), requiring approximately 5.4 ha and 2.2 ha of new lands (currently cultivated), respectively. Permanent stockpile sites and storm water retention ponds may also be constructed at these stations. At both facilities, construction will take about 12 months and require up to 50 workers. • Construction activities will include: site preparation (clearing of vegetation, where present); topsoil salvage; grading (as required); installation of facilities and equipment; and clean-up and reclamation (area recontoured and a gravel surface will be placed or restored over high traffic areas). • Potential construction of additional power infrastructure (provided by a third party) for the new pump stations.

Project Components and Activities
Storage Tanks: • Construction of three new 50,000 m^3 (314,000 bbl) storage tanks and associated infrastructure, and a retention pond for collection of surface run-off at Enbridge's existing Hardisty Terminal. These facilities will be installed on Enbridge-owned lands that were previously undisturbed (land use is not currently industrial). A peak workforce of 250 is anticipated at Hardisty Terminal. • Hydrotesting of tanks prior to operation using water as primary test medium.
Remotely-operated Sectionalizing Valves (RSV): • Construction of RSVs at 36 locations within the permanent easement obtained for the Line 3 Replacement Pipeline, and at each terminal and pump station.
Communication Towers: • Construction of 23 communications towers of varying heights from 6 to 46 metres, at select RSV locations and facility sites. All locations are on the construction RoW or on adjacent Enbridge RoWs. • Tower construction will include: site preparation (clearing of vegetation, topsoil salvage, grading); construction of foundations; on-site assembly using cranes (lifting into place, addition of accessories, cable management); and clean-up and reclamation (area returned to pre-disturbance site conditions and seeded). Towers will require extra temporary workspace (TWS) to facilitate construction.
Permanent access roads: • Construction of permanent access roads at West Milden and Richardson pump stations, requiring a total of 0.02 ha of land, and at 26 RSV sites, requiring about 4 ha of land. The majority of permanent access would cross cultivated lands. • Road construction will include surveying, clearing, topsoil salvage, grading, and installation of permanent culverts.
Pipeline: • New 914.4 mm O.D. pipeline (NPS 36) in two segments, totaling about 1,096 km (101 km in Alberta, 689 km in Saskatchewan, and 306 km in Manitoba). The pipeline route parallels Enbridge's Alberta Clipper pipeline RoW for approximately 912 km (83% of total length), and existing linear RoWs and disturbances for approximately 968 km (88% of total length). • Construction RoW will be typically 45 m wide, including new permanent easement and TWS. Permanent easement will be 12 to 15 m wide in areas where the RoW is not adjacent to other Enbridge RoWs, and 1 to 12 m wide where it adjoins existing Enbridge RoWs. • Travel lanes and other temporary facility areas subject to frequent travel may be graveled; any gravel placed during construction would be removed during clean-up. • Pipeline construction activities include: surveying (for example, flagging, staking, fencing); clearing of snow (if present), clearing/mowing of vegetation; burning, chipping or mulching of non-salvageable timber; topsoil salvage; grading; pipe stringing and bending; welding and coating, trenching, lowering-in and backfilling; trench dewatering where required during lowering-in. • Trenchless pipeline crossings at Qu'Appelle, South Saskatchewan and Souris rivers, Chapleau Lakes, and several irrigation canals. Other fish-bearing waterbodies will be crossed using an isolated method (if water present), or an open cut method (if dry or frozen). Non-fish bearing watercourses will be crossed using open cut (if water present) or standard trench (if dry or frozen to bottom). • Construction of snowfill/ice bridges, clear span bridges, or use of log/swamp mats for temporary vehicle/equipment crossings. • Crossing of roads, railways, foreign cable or pipelines using a slip bore or open cut method. • Hydrostatic testing of all piping. Fresh water drawn from surface sources will be used. No chemical additives will be used.

Project Components and Activities
• Clean-up and reclamation: initial rough clean-up and reclamation activities following backfilling. Removal of vehicle crossing structures at watercourse and wetland crossings. Final clean-up and reclamation from October 2016 to December 2017, depending on the spread. All disturbed, non-cultivated, upland areas will be seeded.
Temporary Work Camp(s): • Potential construction of temporary work camp(s). Final sites have not been determined. • Activities at any selected work camp site are expected to include: site preparation and set-up of camp facilities; use of the site; and dismantling of the camp, including reclamation of the lands. Temporary camps may require water withdrawal.
Operation Phase – Timeframe: estimated in-service date is Q4 2017 with line fill activities extending into Q2 2018. The service life is estimated to be 50 years.
• Aerial and ground patrols of the pipeline RoW, pipeline inspections using pigs (twice per month), depth of cover surveys, cathodic protection and RSV facility inspections. RoW maintenance activities, including vegetation and weed management, ground stabilization, erosion control, re-establishing appropriate depth of cover, regrading land to appropriate contours or conducting investigative excavations. • Monthly facility and regular patrol programs for permanent facilities. • Use of permanent access roads.
Abandonment Phase – Timeframe: At the end of the service life of the Line 3 Replacement Pipeline.
• Pursuant to the NEB Act, an application would be required to abandon the Line 3 Replacement Pipeline, at which time the environmental effects would be assessed by the NEB.

7.4.2 Environmental Setting

The following environmental setting applies to the entirety of the Line 3 Replacement Pipeline area, unless otherwise indicated.

Crown Lands

- The Line 3 Replacement Pipeline route traverses 50.2 km of federal and provincial Crown lands: 0.7% of the total length is federal Crown land, and 4% is provincial Crown land.

Physical Environment

- Lies within five physiographic regions: the Eastern Alberta Plains, Alberta High Plains, Saskatchewan Plains, Western Uplands and Manitoba Lowlands. The topography in these regions varies from very gently undulating to rolling, with localized areas that are hummocky, strongly rolling and hilly.
- Terrain is considered to be stable; however, areas of potential slope instability may be present on the steep approach slopes associated with the crossings of Eagle Creek, South Saskatchewan River, Souris River and Qu'Appelle River.

Soil and Soil Productivity

- Most of the Line 3 Replacement Pipeline route is located in the Dark Brown Soil Zone in Alberta and Saskatchewan while the entire route in Manitoba is located in the Black Soil Zone. Chernozemic soils are the dominant soils encountered along the route in all three provinces.

- Approximately 20% of the route crosses saline and/or sodic soils, including Chernozemic soils with saline lower subsoils, Chernozemic soils with saline upper and lower subsoils, poorly-drained saline Gleysols, Solonetzic Chernozems and Solonetzic soils.

- Lands in the vicinity of the Line 3 Replacement Pipeline in Alberta generally have a low wind erosion risk, with the exception of an area of high wind erosion risk along the route between Hardisty and Provost. In Saskatchewan, the wind erosion risk ranges from low to high, with the lands immediately east of Regina having the most severe risk of erosion. In Manitoba, the wind erosion risk is generally low, with isolated areas of higher risk.
- The water erosion risk is generally low due to the flat terrain, with areas of moderate to high erosion potential on steep slopes associated with drainage systems.

Soil Contamination

- There is known soil contamination within the vicinity of the Line 3 Replacement Pipeline route, as a result of historical releases from operating the Existing Line 3 Pipeline and the other NEB-regulated pipelines in Enbridge's Mainline Corridor, nearby third-party pipelines and from other sources. In addition, other undiscovered contaminants of concern may be present as a result of previous pipeline activities and as a result of spot spills and leaks during past farming activities.
- The Federal Contaminated Sites Inventory, Saskatchewan Upstream Oil and Gas Sites Spill Notification Database and Manitoba Contaminated Sites List indicate that there are various active and historical contaminated sites in the vicinity.

Clubroot

- The risk of clubroot infestation in soils in the vicinity of the Line 3 Replacement Pipeline route is considered medium to high in Alberta and low in Saskatchewan and Manitoba. Flagstaff County, AB is the only area near the route in which infestations have been identified.

Vegetation

- The Line 3 Replacement Pipeline route crosses the Central Parkland and Northern Fescue Natural Subregions (Alberta), the Aspen Parkland, Moist Mixed Grassland, and Mixed Grassland Ecoregions (Saskatchewan), and the Aspen Parkland, Boreal Transition and Lake Manitoba Plain Ecoregions (Manitoba).
- About 94% of the Prairie Ecozone, within which the Line 3 Replacement Pipeline is located, consists of farmland. About 16% of the Vegetation RSA consists of native vegetation.
- The Line 3 Replacement Pipeline route would cross tame pasture, native grassland, treed pasture, and wetland areas in all three provinces, as well as deciduous forests in Alberta and Manitoba.
- Terrestrial land use types along the Line 3 Replacement Pipeline route are (by %): cultivated (69.6), tame pasture (9.7), hay (8.9), native prairie (5.5), treed pasture (4.0), treed (0.8), disturbed (0.7), pasture (0.3), and shrub pasture (0.2).

- In each of Alberta, Saskatchewan and Manitoba, a number of provincially-designated invasive plant species were observed during field surveys, as well as many non-listed, non-native vegetation species. In Alberta, one prohibited noxious species (Nodding thistle) was observed.
- The Line 3 Replacement Pipeline route crosses seven Alberta-designated Environmentally Significant Areas, many of which contain plant species of conservation concern. It also crosses the Oak Lake Sandhills and Wetlands Natural Area in Manitoba, where sandhill slopes provide habitat for rare plants.

Vegetation Species at Risk

- In Alberta, no plant species listed on Schedule 1 of the *Species at Risk Act* (SARA) or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and no rare plants or rare ecological communities with an Alberta *Wildlife Act* designation are expected to occur along the construction RoW, based on known ranges, historical observations, and habitat requirements, and none were observed during field surveys.
- The following plants listed on SARA Schedule 1 or by COSEWIC may occur along the construction RoW in Saskatchewan and Manitoba, based on known ranges, historical observations, and habitat requirements:

Species	Status	Potential Location
Small-flowered sand-verbena[1]	SARA Schedule 1 – Endangered	Saskatchewan (Moist Mixed Grassland Ecoregion)
Buffalo-grass	SARA Schedule 1 - Threatened	Saskatchewan (Moist Mixed Grassland Ecoregion)
Smooth arid goosefoot[2]	SARA Schedule 1 - Threatened	Saskatchewan (Moist Mixed Grassland Ecoregion); Manitoba (Aspen Parkland Ecoregion)
Slender mouse-ear cress[1]	SARA Schedule 1 - Threatened	Saskatchewan (Mixed Grassland Ecoregion)
Rough agalinis[2]	SARA Schedule 1 – Endangered	Manitoba (Aspen Parkland and Lake Manitoba Plains Ecoregions)
Small white lady's slipper[2]	SARA Schedule 1 – Endangered	Manitoba (Aspen Parkland and Lake Manitoba Plains Ecoregions)
Hairy prairie clover[2]	SARA Schedule 1 - Threatened	Manitoba (Aspen Parkland and Lake Manitoba Plains Ecoregions)
Western spiderwort[2]	SARA Schedule 1 - Threatened	Manitoba (Aspen Parkland Ecoregion)

[1] also listed under the Saskatchewan *Wildlife Act*
[2] also listed under the Manitoba *Endangered Species and Ecosystems Act*

- Of the SARA-listed species that may occur, Project-specific field surveys confirmed the presence of small-flowered sand-verbena and smooth arid goosefoot in the vicinity of the pipeline crossing on the east bank of the South Saskatchewan River. The Recovery Strategies for both species define critical habitat as the area encompassing the occurrence and all natural landforms, soil and vegetation features within a 300 m distance of the occurrence. Although the occurrences of both species would be avoided by the HDD

of the South Saskatchewan River, the drilling workspace overlaps the defined critical habitat area.

Vegetation Species of Special Status or Conservation Concern

- A number of plant species or ecological communities of conservation concern were observed during field surveys or in past surveys along Enbridge's existing mainline corridor:
    - 12 plant species considered rare in Alberta (Alberta Conservation Information Management System (ACIMS)-listed). One ACIMS-listed rare ecological community (creeping juniper/June grass/green reindeer lichen) was observed.
    - 25 plant species considered rare in Saskatchewan (Conservation Data Centre (CDC)-listed). Fescue-dominated communities are considered by the province to be unique ecological communities, although they are not tracked. No native fescue dominated communities were observed during the vegetation surveys.
    - 13 plant species and two ecological communities (a dominated sprangletop community and a dominated bur oak community) considered rare in Manitoba (CDC-listed).

Water Quality and Quantity

Surface Water

- The Line 3 Replacement Pipeline route crosses 132 watercourses and five river basins: the North Saskatchewan (Alberta and Saskatchewan), South Saskatchewan and Qu'Appelle (Saskatchewan), Assiniboine (Saskatchewan and Manitoba) and Red River (Manitoba) basins.
- Mean monthly flows are generally highest in April/May, while the lowest flows are expected to occur from November to February. An exception is the South Saskatchewan River, whose natural flow regime has been affected by dams and the formation of Lake Diefenbaker as a water supply reservoir. Mean monthly flows on this river are lowest in April and highest in January, due to winter power demands for hydroelectricity.
- Surface disturbances comprise almost 80% of the aquatics RSA, and are primarily due to agriculture.
- In Alberta, the route crosses seven Aquatic Environmentally Significant Areas defined under Alberta legislation, including Eyehill and Ribstone creeks, which are designated due to their contribution to water quality.
- In Saskatchewan, the route crosses the South Saskatchewan River, Macrorie and Rocky Lake irrigation districts, and a nominated Canadian Heritage River (South Saskatchewan River).
- In Alberta, surface water quality risk near the Line 3 Replacement Pipeline route is primarily rated 0.76-1.00 (with 1 being the highest risk and 0 being the lowest risk). Agricultural land use contributes to high risk ratings, due to non-point sources of pollution being transferred from land or by atmospheric processes to water bodies. The Saskatchewan Watershed Authority considers the Assiniboine River water quality to be generally good, and as agriculture is rated as a higher risk land use, it considers introduction of excess nutrients as a major stressor to the watershed. The Red River Basin

surface water quality is generally considered good; however, it requires continual monitoring and researching of causes of water quality impairment.

Groundwater

- Main aquifers along the Line 3 Replacement Pipeline route are:
    - Alberta: the Battleford Valley aquifer (sand and gravel) and the Belly River Group (bedrock). Groundwater quality for these aquifers is variable. The Line 3 Replacement Pipeline route overlaps the Battleford Valley aquifer only at the most westerly point near Hardisty.
    - Saskatchewan: Judith River Formation (bedrock). Other aquifers along the Line 3 Replacement Pipeline route include the Bearpaw Formation (bedrock), Tyner Valley (sand and gravel), and Eastend-Ravenscrag Formation (bedrock). Groundwater quality for these aquifers is variable. Most of the Line 3 Replacement Pipeline route east of Regina does not cross major aquifers.
    - Manitoba: the Oak Lake, Assiniboine Delta, and Winkler aquifers. All three are sand and gravel aquifers. These aquifers are generally closer to the surface and not as thick as the aquifers in Alberta and Saskatchewan. Groundwater quality for the Oak Lake and Assiniboine Delta aquifers is considered good and good to excellent, respectively. The Winkler aquifer is susceptible to contamination from recharge water and saline groundwater intrusion. The majority of the route in Manitoba is not underlain by a major aquifer.
- There are no known recorded springs along the Line 3 Replacement Pipeline route.

Aquatic Species and Habitat

- The fish communities are predominantly coolwater species. Some coldwater species may be present in the South Saskatchewan River, and warmwater species may be present in the Qu'Appelle, Assiniboine and Red river basins. They are primarily spring or summer spawners, although some winter or fall spawners occur (for example, lake whitefish and burbot).
- About 20 species of sportfish and 45 species of non-sportfish are known to occur in the river basins crossed by the Line 3 Replacement Pipeline.
- There are 14 native freshwater mussel species with potential to occur near the Line 3 Replacement Pipeline route. Five of these species may occur near the Line 3 Replacement Pipeline route within Alberta, nine in Saskatchewan, and all 14 in Manitoba. One invasive species, the zebra mussel, was recently documented in Manitoba, but none were captured or observed during Project-specific surveys, nor have any been previously documented at the watercourse crossings along the Line 3 Replacement Pipeline route.
- A total of 26 fish species and one confirmed mussel species were sampled or observed at watercourse crossings during field surveys for the Project.
- No fish were captured and no mussels were observed at Alberta watercourse crossings. Northern pike, shorthead redhorse, white sucker, fathead minnow and brook stickleback have been previously documented.

- Thirteen species of fish were confirmed at watercourse crossings in Saskatchewan, including northern pike (Qu'Appelle River, Iskwao Creek, Wascana Creek), walleye (Qu'Appelle River), whitefish (South Saskatchewan River) and bigmouth buffalo (Qu'Appelle River). An additional 24 fish species have been previously documented. No mussels were observed.
- Twenty species of fish were confirmed at watercourse crossings in Manitoba, including northern pike (Spring Brook, Oak Creek), walleye and yellow perch (Souris River), and rock bass (Oak Creek). In addition, one adult chestnut lamprey was captured in Oak Creek. An additional 27 fish species have been previously documented in the watercourses crossed by the Line 3 Replacement Pipeline in Manitoba. Fatmucket mussels and shells of unidentified mussel species were observed in the Cypress River. In Pipestone Creek, shells suspected to be white heelsplitter, giant floater, and cylindrical papershell were observed, and unidentified mussel shells were observed in Oak Creek (suspected to be cylindrical papershell). Mussels could not be sampled at the Souris River crossing due to high water levels, although fatmucket and white heelsplitter mussels have been previously documented near the crossing site.
- The Line 3 Replacement Pipeline route crosses a total of 132 watercourses and drainages, of which 59 are fish-bearing and 73 are not fish-bearing:

Type	Number of Watercourse and Draining Crossings along the Line 3 Replacement Pipeline Route			
	Alberta	Saskatchewan	Manitoba	Total
Fish-bearing	2	36	21	**59**
Nonfish-bearing	2	46	25	**73**
Total	**4**	**82**	**46**	**132**

- No watercourses or other fish-bearing water bodies were identified within 30 m of proposed tower sites, permanent access roads, or stockpile sites. At pump station sites, no work will be conducted within 30 m of any fish-bearing water bodies.

Aquatic Species at Risk

- Federally-listed aquatic species (COSEWIC and/or SARA Schedule 1 designation) identified as having the potential to occur along the Line 3 Replacement Pipeline route, based on known ranges and preferred habitat availability, are:
    - lake sturgeon (Saskatchewan Rivers and Red-Assiniboine Rivers-Lake Winnipeg populations);
    - bigmouth buffalo (Saskatchewan-Nelson River population); and
    - mapleleaf mussel (Saskatchewan-Nelson population).
- There are no COSEWIC or SARA-listed aquatic species known to occur in the vicinity of Line 3 Replacement Pipeline watercourse crossings within Alberta.

- The Saskatchewan-Nelson River population of bigmouth buffalo (SARA Schedule 1 – Special Concern) were captured in the vicinity of the Qu'Appelle River crossing during field studies for the Project. The species was not captured or observed at any other watercourse crossing site. Because of their preference for deep pools of large streams, it is unlikely that they occur in the small tributaries to the Qu'Appelle River crossed by the Line 3 Replacement Pipeline.
- The Saskatchewan-Nelson River population of bigmouth buffalo is also known to occur in the Red River Basin in Manitoba, specifically in the Red River mainstem. Due to their habitat preferences, it is unlikely that they occur in the tributaries to the Red River that are crossed by the Line 3 Replacement Pipeline route, and none were captured or observed during Project-specific field studies in Manitoba.
- The Saskatchewan River population of lake sturgeon, including the populations in both the North and South Saskatchewan river basins in Saskatchewan, is listed as Endangered under COSEWIC. Lake sturgeon is not known to occur in any of the watercourses crossed by or near the Line 3 Replacement Pipeline route in the North Saskatchewan River Basin. In the South Saskatchewan River Basin, lake sturgeon has been documented in Lake Diefenbaker and in the South Saskatchewan River downstream of Saskatoon. No recent occurrences have been reported between the Gardiner Dam on Lake Diefenbaker and the City of Saskatoon, where the proposed crossing of the South Saskatchewan River is located. No lake sturgeon were captured or observed in Project-specific field studies in Saskatchewan.
- In Manitoba, the Red-Assiniboine Rivers-Lake Winnipeg populations of lake sturgeon are listed as Endangered under COSEWIC. Lake sturgeon is known to occur in watercourses crossed by or near the Line 3 Replacement Pipeline route in Manitoba. The Assiniboine River was stocked between 1996 and 2008 near Brandon. Anglers currently report catching and releasing lake sturgeon in the Assiniboine River, but no natural reproduction has been documented. Due to the relatively close proximity of the proposed Souris River crossing to the confluence of the Assiniboine River, there is the potential for lake sturgeon to occur near the Project. However, a small dam on the Souris River at the Town of Wawanesa may prevent lake sturgeon from migrating upstream to the proposed Line 3 Replacement Pipeline crossing. No lake sturgeon were captured or observed in Project-specific field studies in Manitoba.
- The Saskatchewan-Nelson population of mapleleaf mussel in Manitoba (SARA Schedule 1 - Endangered) has been documented in the Assiniboine River mainstem; however, the species has not been documented in any of the watercourses crossed by the Line 3 Replacement Pipeline route nor were any maple leaf mussels found during the Project field program. Channel catfish, which are known to be a suitable host species for mapleleaf mussel, have been documented in the Qu'Appelle and Assiniboine rivers. Other catfish species occur in watercourses crossed by the Line 3 Replacement Pipeline route and are potential hosts. Channel catfish were not captured or observed during the field program for the Project.
- There are no critical habitats for fish species at risk in the vicinity of the Line 3 Replacement Pipeline, other than for the Assiniboine River, which the route does not cross.

Aquatic Species of Special Status or Conservation Concern

- A number of fish species of conservation concern provincially have potential to occur in watercourses crossed by the Line 3 Replacement Pipeline, including three species in Alberta, 20 species in Saskatchewan, and six species in Manitoba. Of these, only the river shiner, considered rare/uncommon in Manitoba, was confirmed in that province during field studies for the Project.
- Native mussel species of conservation concern provincially are fatmucket, white heelsplitter and giant floater (Sensitive in Alberta); Creek heelsplitter (May be at Risk in Alberta); and three ridge and Wabash pigtoe (rare/uncommon to common in Manitoba). No species with provincial rankings were observed during field surveys for the Project; however, it is noted that all mussel species in Saskatchewan and most species in Manitoba have not been ranked due to data deficiencies.

Wetlands

- The Line 3 Replacement Pipeline route crosses one wetland region (the Continental Prairie Wetland Region) and two wetland subdivisions (the Aspen Parkland Continental Prairie Wetlands subdivision (P_{CA}) in Alberta, Saskatchewan and Manitoba, and the Grassland Continental Prairie Wetlands subdivision (P_{CG}) in Saskatchewan and Manitoba).
- Characteristic wetlands of the P_{CA} Wetlands subdivision consist of shallow basin and kettle marshes associated with fresh to saline shallow water encircled by tall shrubs or hardwood with limited development of well-humified peat. Characteristic wetlands of the P_{CG} Wetlands subdivision consist of shallow basin marshes associated with fresh to saline shallow waters. Seasonal ponds and semi-permanent open shallow water lakes with high salinity are common and peat development is absent.
- In Manitoba, the Line 3 Replacement Pipeline route encounters the Oak Lake Sandhills and Wetland Natural Area (SKP 965.6 to 1060.0), which has sprawling wetlands that support a high level of natural biodiversity. This privately owned land is protected by a conservation agreement.
- Wetlands comprise almost 27% (879,247 ha) of the wetland RSA. Most of the existing disturbances to wetlands are related to agricultural activities. Cultivation and agronomic seeding in wetland margins and riparian areas, and disturbance by livestock grazing are commonly observed in the Project area. Disturbance of wetlands from past pipeline projects on existing RoWs is also present.

- Summary of Wetlands Encountered by the Line 3 Replacement Pipeline route:

Wetland Type (Class)	Number of Wetlands (Area in Hectares)			
	Alberta	Saskatchewan	Manitoba	Total
Ephemeral/temporary marsh (Class I/II)	38 (7.7)	209 (39.6)	78 (16.6)	**325 (63.9)**
Seasonal marsh (Class III)	50 (16.1)	596 (153.8)	99 (41.5)	**745 (211.4)**
Semi-permanent marsh (Class IV)	12 (5.6)	79 (66.2)	20 (76.6)	**111 (148.4)**
Permanent marsh (Class V)	4 (5.5)	30 (27.4)	3 (1.1)	**37 (34)**
Alkali marsh (Class VI)	1 (0.5)	2 (5.7)	0 (0.0)	**3 (6.2)**
Shrubby swamp	4 (1.0)	22 (4.4)	2 (0.6)	**28 (6.0)**
Treed swamp	3 (0.3)	15 (1.7)	7 (3.9)	**25 (5.9)**
Total	**112 (36.7)**	**953 (298.8)**	**209 (140.3)**	**1,274 (475.8)**

- Work at the existing pump stations would not occur within wetlands, although there are wetlands within 30 m of most sites. There are no wetlands within 30 m of the new pump station site at West Milden. There is one Class IV wetland adjacent to the proposed boundary of the new Richardson pump station.
- No wetlands are encountered at RSV sites or permanent access roads, although some of these components are located within 30 m of wetlands.
- Temporary facilities would encounter a total of 27 wetlands (15.2 ha), about half of which are seasonal marshes.

Wildlife and Wildlife Habitat

- Existing anthropogenic disturbance and agricultural crop/tame pasture lands account for approximately 78.4% of the Wildlife RSA.
- Important wildlife features encountered by or in the vicinity of the Line 3 Replacement Pipeline route include nesting waterbodies for waterfowl and waterbirds, breeding waterbodies for various amphibians, overwintering waterbodies for northern leopard frogs, ferruginous hawk nests, sharp-tailed grouse leks and snake hibernacula. Suitable migratory bird habitat is encountered in the vicinity of the construction RoW.

- The Line 3 Replacement Pipeline is located within the key program area of the North American Waterfowl Management Plan (NAWMP) in the Prairie Pothole Region. These areas provide important nesting areas and migration stopover sites for waterfowl populations and are recognized as high priority areas for waterfowl conservation. The Line 3 Replacement Pipeline crosses one NAWMP priority area in Alberta, five priority areas in Saskatchewan and two priority areas in Manitoba.
- The Line 3 Replacement Pipeline route crosses the following International Bird Areas (IBAs), all of which are globally significant and provide breeding or migratory habitat for many species of birds:
    - Metiskow and Sunken Lakes IBA and Hansman Lake IBA in Alberta;
    - Barber Lake IBA in Saskatchewan, within which the West Milden pump station site is located; and
    - Oak Lake/Plum Lake Area IBA in Manitoba.
- The Line 3 Replacement Pipeline route crosses ten Ducks Unlimited (DU) projects: two in Alberta, six in Saskatchewan, and two in Manitoba.
- Provincially-identified wildlife areas in Alberta that overlap with the Line 3 Replacement Pipeline route are:
    - Sensitive Amphibian Range from about SKP 224.4 to SKP 284.9, which includes the Metiskow Station. The range is based upon the combination of plains spadefoot toad and Great Plains toad occurrences in Alberta. Plains spadefoot toads (May be at Risk in Alberta) were heard at potential breeding waterbodies in this area.
    - Sharp-tailed Grouse Range from about SKP 184.6 to SKP 284.9, which indicates the potential occurrence of sharp-tailed grouse leks in suitable habitat. The Hardisty Terminal and Metiskow Station are located within this range. Sharp-tailed grouse are considered sensitive in Alberta. Habitat suitable for sharp-tailed grouse leks was observed in these areas, but no leks were identified.
- Wildlife areas crossed by the Line 3 Replacement Pipeline route in Saskatchewan include:
    - several *Wildlife Habitat Protection Act* (WHPA) parcels, which are natural upland and wetland areas on Crown land that are protected to maintain existing wildlife populations and conserve native ecosystems in agricultural areas of the province;
    - three Agriculture and Agri-Foods Canada Community Pasture Program lands: Progress, Mariposa and Elbow pastures. These lands were established to help to preserve the biodiversity of the prairie region, protect land from erosion and provide wildlife habitat;
    - the Kendal Game Preserve, which supports a high diversity of wildlife, including ungulates, grassland birds and waterfowl;
    - Cosine Lake and Shallow Lake Migratory Bird Concentration sites, which provide good breeding, staging and moulting habitat for migratory passerines or waterbirds. Shallow Lake is within the Progress Pasture on AAFC lands.

- Wildlife areas crossed by the Line 3 Replacement Pipeline route in Manitoba include:
    - the Oak Lake Sandhills and Wetland Natural Area from SKP 965.6 to SKP 1060.0;
    - the Kozak (SKP 1073.8 to SKP 1075.5) and the Cunningham (SKP 1078.0 to SKP 1078.8) conservation agreements. These provide long-term protection and conservation of wildlife habitat.
- During Project-specific field studies, the following were observed:
    - Alberta: 15 mammal species, over 125 bird species, and five amphibian species
    - Saskatchewan: 15 mammal species, over 120 bird species, five amphibian species and one reptile
    - Manitoba: Seven mammal species, over 80 bird species, five amphibian species and one reptile species.

Wildlife Species at Risk

- Twenty-five federally-listed wildlife species have the potential to occur within 2 km of the Line 3 Replacement Pipeline route, based on known ranges and preferred habitat availability. Sixteen species were observed during Project-specific field studies.

Wildlife Species (and relevant province)	SARA Schedule 1	COSEWIC
Mammals		
American badger (AB, SK, MB)*	--	Special Concern
Little brown myotis (AB, SK, MB)	Endangered	Endangered
Birds		
Baird's sparrow (AB, SK, MB)*	--	Special Concern
Bank swallow (AB, SK, MB)*	--	Threatened
Barn swallow (AB, SK, MB)*	--	Threatened
Bobolink (AB, SK, MB)*	--	Threatened
Burrowing owl (SK)	Endangered	Endangered
Chestnut-collared longspur (AB, SK, MB)*	Threatened	Threatened
Chimney swift (SK, MB)	Threatened	Threatened
Common nighthawk (AB, SK, MB)*	Threatened	Threatened
Eastern wood-pewee (MB)*	--	Special Concern
Ferruginous hawk (AB, SK, MB)*	Threatened	Threatened

Wildlife Species (and relevant province)	SARA Schedule 1	COSEWIC
Horned grebe (AB, SK, MB)*	--	Special Concern
Loggerhead shrike (AB, SK, MB)*	Threatened	Threatened
Long-billed curlew (AB, SK)*	Special Concern	Special Concern
McCown's longspur (SK)	Special Concern	Special Concern
Peregrine falcon (subspecies *anatum*) (AB, SK)	Special Concern	Special Concern
Piping plover (AB, SK, MB)	Endangered	Endangered
Red-headed woodpecker (SK, MB)	Threatened	Threatened
Short-eared owl (AB, SK, MB)*	Special Concern	Special Concern
Sprague's pipit (AB, SK, MB)*	Threatened	Threatened
Yellow rail (AB, SK, MB)	Special Concern	Special Concern
Amphibians		
Northern leopard frog (SK, MB)*	Special Concern	Special Concern
Tiger salamander (AB, SK, MB)*	--	Special Concern
Reptiles		
Snapping turtle (SK, MB)	Special Concern	Special Concern

*species or sign observed during Project-specific field studies

- The Line 3 Replacement Pipeline route does not cross any identified or proposed critical habitat for a SARA-listed wildlife species in existing or proposed recovery plans.

Wildlife Species of Special Status or Conservation Concern

- About 36 wildlife species of conservation concern to the provinces have been documented within 2 km of the Line 3 Replacement Pipeline RoW. This includes pronghorn antelope (Alberta and Saskatchewan), about 31 species of birds, and several amphibian and reptile species.
- Species listed under provincial wildlife acts that may occur in the vicinity of the Line 3 Replacement Pipeline include:
    - Alberta *Wildlife Act*: piping plover and ferruginous hawk (Endangered); western grebe (Threatened); Sprague's pipit, loggerhead shrike and black-throated green warbler (Special Concern).
    - Saskatchewan *Wildlife Act*: burrowing owl and piping plover (Endangered).

- Manitoba *Wildlife Act*: Baird's sparrow, burrowing owl, chestnut-collared longspur, ferruginous hawk, loggerhead shrike, trumpeter swan (Endangered); common nighthawk, short-eared owl, Sprague's pipit (Threatened).

Atmospheric Environment

- Ambient air quality in the vicinity of the Line 3 Replacement Pipeline is primarily a function of anthropogenic sources of emissions including agricultural activities and fossil fuel-based transportation. Environment and Climate Change Canada's (ECCC) National Pollutants Release Inventory (NPRI) database indicates that the major industrial Criteria Air Contaminant (CAC) emitters within the Project area belong to the oil and gas sector (terminals, batteries, compressors and gas plants) in all three provinces, and the manufacturing sector in Manitoba.
- Ambient air quality is generally considered good to excellent, and reported values from representative air quality monitoring stations in the vicinity of the Line 3 Replacement Pipeline are below the applicable provincial Ambient Air Quality Objectives.
- The total annual provincial and national greenhouse gas (GHG) emissions in 2013, in tonnes Co_2Eq, for the Energy Transport - Pipelines sub-sector was: 2.14 million in Alberta; 2.03 million in Saskatchewan; 102,000 in Manitoba; and 6.39 million in Canada. The total annual provincial and national GHG emissions in 2013 for the provinces of Alberta, Saskatchewan and Manitoba in 2013 were 267 million, 74.8 million and 21.4 million, respectively.

Acoustic Environment

- Ambient noise is primarily caused by anthropogenic sources including roads, rail transportation, airports, industrial facilities and agricultural activities. The potential receptors to nuisance noise emissions include local residences and communities in the Line 3 Replacement Pipeline area.

Human Occupancy and Resource Use

- The Line 3 Replacement Pipeline route crosses one municipal district (MD) in Alberta, 28 rural municipalities (RMs), two towns and five villages in Saskatchewan, and 12 RMs in Manitoba.
- The following communities have residential areas that are located within 1 km of either side of the Project footprint: the towns of Kerrobert, Kipling and Gretna; and the villages of Dodsland, Milden, Grand Coulee, Vibank, Odessa, Kendal, Montmartre, Fairlight and Maryfield. Scattered rural residences are also located within 1 km of the Project footprint, as well as four identified Indian Reserves of the Swan Lake First Nation and two Indian Reserves of the Cowessess First Nation.
- The Line 3 Replacement Pipeline route crosses various areas of land use including agricultural, oil and gas and, in Alberta, subsurface mining. In general, the majority of the land along the Line 3 Replacement Pipeline route is cultivated for private agricultural use.

- Existing activities pertaining to resource use along the Line 3 Replacement Pipeline route include: agriculture (crop and forage production as well as cattle grazing); utility activities (transmission lines, gas distribution lines); power generation (wind energy, hydro-electric energy); transportation development (road infrastructure and railways); and oil and gas exploration and development activities.
- Fall is hunting season for most big game species and trapping seasons are generally open from early fall to late spring. There are 16 guide outfitter territories crossed by the Line 3 Replacement Pipeline route in Alberta. Trapping is common in Alberta and the Line 3 Replacement Pipeline route crosses Fur Management Zone 7. Angling is considered both a recreational activity and a contributor to the provincial economy, and fishing seasons span throughout the year. In Saskatchewan, the Line 3 Replacement Pipeline route crosses several trapping areas and the Southern Zone where most of the fishing in the province takes place. In Manitoba, the Line 3 Replacement Pipeline crosses several trapping and hunting areas and the Southern Fishing Division.
- There are no known designated recreational land uses that are crossed by the Line 3 Replacement Pipeline route, with the exception of recreational trails and paddling routes in Saskatchewan and Manitoba.
- Groundwater is a primary source of water for the populations of Alberta, Saskatchewan and Manitoba. The number of water wells within a 0.5 km radius of the Line 3 Replacement Pipeline in Alberta, Saskatchewan and Manitoba are about 204, 329 and 329, respectively. Most of the groundwater wells in each province are used for domestic purposes.

Heritage Resources

- According to the results from past assessments of the pipeline rights-of-way that parallel the Line 3 Replacement Pipeline, there is low potential for encountering palaeontological resources during the construction phase in Alberta, Saskatchewan and Manitoba due to poor exposure of fossil-bearing geological units, which are buried beneath glacial till and gravel deposits.

Traditional Land and Resource Use

- The MMF submitted that there is ongoing Métis land use and occupancy within and adjacent to Enbridge's RoW. It identified a total of 1,133 locations of Metis land use and occupancy within the Geographic Scope of its Traditional Knowledge and Land Use Study, in the categories of hunting, fishing, trapping, gathering, agriculture/beekeeping, access points, routes, overnight sites, and cultural sites. MMF indicated that its members consume or utilize resources in the area for country foods.
- Asini Wachi Nehiyawak Traditional Band (AWNTB) submitted that it has sites of archaeological, cultural, spiritual and historical importance or interest along the RoW, including some spiritual sites, ceremonial sites, historic camps and burials.
- Onion Lake Cree Nation (Onion Lake) indicated that it uses the Project area for hunting, gathering medicinal plants and spiritual and cultural practices. Onion Lake noted that Buffalo Sage, a traditional medicine, was discovered along the RoW during a site visit of

the Project area. Onion Lake identified Sounding Lake, Alberta and surrounding area to be of spiritual significance, noting that the area is used for hunting and is frequently used for ceremonial purposes. It is located 20 km south of the Project RoW.

- Peguis First Nation (Peguis) identified plants it harvests, both for medicine and food, in the Project area, including from the water. Peguis also indicated that it hunts, traps and fishes in the Project area. Peguis indicated that it still exercises Treaty and Aboriginal rights on private land, with permission to do so, whether it is hunting, gathering, or fishing, and harvesting of plants, berries and medicines.
- Pine Creek indicated that it uses waters in the Project area, including for food gathering purposes.
- Samson identified several specific sites of historical significance including the historic Bison Pound in Alberta. Samson indicated that it uses waterways such as the Red Deer River as a primary water source.
- Dakota Tipi stated that the Project will traverse a large swath of their traditional territory and areas where their members have and continue to utilize lands, resources, waters and resources for traditional purposes. These rights include the Aboriginal right to hunt, fish, trap, harvest plants and earth materials, harvest timber, travel to and from and access traditional and current use areas, maintain homes, cabins and camps, harvest wild rice and other cultural crops, participate in trade and other activities that are central to the distinctive culture, socio-cultural and spiritual well-being of the Dakota people.
- Enbridge stated that the current land tenure and land use along the Line 3 Replacement Pipeline RoW would appear to preclude the possibility of traditional activities being practiced on the majority of the lands. Enbridge indicated that it assumed that TLRU activities, including fishing, hunting and plant gathering, are potentially practiced on accessible Crown lands along the pipeline route, since a review of available literature indicates that Aboriginal groups have historically used and presently use Crown lands and resources to maintain a traditional lifestyle.

7.4.3 Environmental Effects Analysis

7.4.3.1 Interactions and Potential Adverse Environmental Effects

Table 7-3 identifies the expected interactions between the Line 3 Replacement Pipeline and the environment. It also identifies the potential adverse environmental effects resulting from those interactions.

Table 7-3 - Project-Environment Interactions During Construction and Operation of Line 3 Replacement Pipeline and Related Facilities

	Environmental or Socio-Economic Element	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
Bio-Physical	Physical Environment	▪ Grading, trenching, backfilling and clean-up activities during pipeline construction on moderate to steep slopes and sidehills, and at watercourse crossings. ▪ Pipeline maintenance activities required to address terrain instability issues during operations ▪ No interaction expected during construction and operation of the permanent facilities (for example, pump stations, storage tanks), since these are located on level, stable areas	▪ Terrain instability ▪ Altered topography ▪ Cut slopes that are too steep may not be replaced to the pre-construction profile	7.4.3.4
	Soil and Soil Productivity	▪ Soils handling during construction, and for required integrity digs during pipeline operations (topsoil salvage, three-lift soils handling, trenching, backfilling, topsoil replacement, and reclamation) ▪ Potential disturbance of previous site contamination during construction ▪ Release of hydrostatic test water during construction ▪ Spot spills during construction and operations ▪ Long term topsoil storage at facility sites ▪ Equipment and vehicle traffic during construction and operations ▪ Soil heating during operations	▪ Reduced soil productivity due to: o Topsoil/subsoil mixing o Loss of topsoil o Degradation or loss of soil structure o Surface gravel/subsoil mixing at facilities o Increased stoniness in surface soils o Contamination of soils ▪ Soil erosion ▪ Excessive trench subsidence or remnant trench crown ▪ Spread of clubroot	7.4.3.3 7.4.3.4
	Vegetation	▪ Construction activities, including clearing of vegetation, topsoil salvage, grading, trenching and backfilling, drilling, cleanup and reclamation	▪ Loss or alteration of ornamental trees, windbreaks or shelterbelts ▪ Loss of native vegetation ▪ Changes to native vegetation composition	7.4.3.4 7.6

	Environmental or Socio-Economic Element	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
		▪ Equipment and vehicle traffic during construction and operation ▪ Spot spills or drilling mud release and associated clean-up and reclamation activities during construction or operation ▪ Vegetation maintenance during operation	▪ Loss or alteration of rare plant populations or rare ecological communities ▪ Weed introduction and spread	
	Water Quality and Quantity	▪ Construction activities, including: clearing, topsoil salvage, and grading; pipeline trenching, lowering-in and backfilling; watercourse and wetland crossings; and clean-up and reclamation ▪ Water discharge during pipeline construction dewatering ▪ Instream activities such as trenched crossings and vehicle crossings during pipeline construction ▪ Drilling mud release during trenchless pipeline crossing construction ▪ Installation of culverts during construction ▪ Encounters with springs during pipeline construction ▪ Equipment and vehicle traffic during construction and operation ▪ Spot spills during construction or operation ▪ Withdrawal and release of test water for hydro testing of storage tanks and for hydrostatic testing of pipeline, after construction	▪ Reduction in surface water quality or quantity ▪ Alteration of natural drainage patterns ▪ Alteration of stream flow during instream activities ▪ Changes in groundwater quantity or flow ▪ Reduction in groundwater quality	7.4.3.4 7.4.3.5.1 7.6
	Aquatic Species and Habitat	▪ Fish or mussel salvage prior to pipeline construction ▪ Pipeline construction at watercourse crossings, including clearing, topsoil salvage, grading, trenching, drilling, backfilling, cleanup and reclamation	▪ Loss or alteration of riparian or instream habitat functions ▪ Fish or mussel mortality or injury	7.4.3.4 7.4.3.5.1 7.6

	Environmental or Socio-Economic Element	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
		▪ Release of drilling mud at trenchless crossings during pipeline construction ▪ Withdrawal and release of water for hydrotesting of storage tanks or hydrostatic testing of pipeline, after construction ▪ Bank and riparian restoration or maintenance activities ▪ Construction and maintenance of vehicle crossings ▪ Spot spills during construction or operations ▪ Recreational fishing during construction or operations	▪ Blockage of fish movements ▪ Interbasin transfer of aquatic organisms	
	Wetlands	▪ Construction activities, including vegetation clearing, topsoil salvage, grading, trenching, backfilling, cleanup and reclamation ▪ Dewatering of wetlands during trenched pipeline crossing construction ▪ Equipment and vehicle travel during construction and operations ▪ Spot spills during construction or operations ▪ Removal or alteration of wetland vegetation during pipeline maintenance activities (for example, integrity digs)	▪ Loss or alteration of wetland habitat function ▪ Loss or alteration of wetland hydrological function ▪ Loss or alteration of wetland biogeochemical function	7.4.3.4 7.6
	Wildlife and Wildlife Habitat	▪ Construction activities, including mowing/brushing, vegetation clearing, topsoil salvage, grading, trenching, drilling, backfilling, cleanup and reclamation ▪ Removal of beaver dams during construction ▪ Equipment and vehicle travel during construction and operations ▪ Spot spills during construction and operations ▪ Vegetation maintenance during operations	▪ Loss or alteration of wildlife habitat ▪ Reduced habitat availability and effectivenets ▪ Changes to wildlife movements ▪ Wildlife mortality or injury	7.4.3.4 7.6

	Environmental or Socio-Economic Element	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
		▪ Use of communication towers by hunting raptors during operations ▪ Bird collisions with communication towers during operations		
	Species at Risk or Species of Special Status and Related Habitat	▪ Interactions as described for Vegetation, Aquatic Species and Habitat, and Wildlife and Wildlife Habitat	▪ Loss or alteration of vegetation species at risk or their habitat ▪ Potential effects as described under Aquatic Species and Habitat, to aquatic species at risk ▪ Potential effects as described under Wildlife and Wildlife Habitat, to wildlife species at risk	7.4.3.4 7.6 7.6.2
	Atmospheric Environment	▪ Slash burning associated with clearing of forested land and bush during pipeline construction ▪ Equipment and vehicle use during construction and operation ▪ Operation of new storage tanks at Hardisty Terminal ▪ Operation of new pump units ▪ Aerial patrols during pipeline operation	▪ Decreased visibility from smoke when slash burning ▪ Increased air emissions (CACs including NO_x, CO, PM, volatile organic compounds (VOCs) and SO_x) and GHG emissions (CO_2, CH_4, N_2O) during pipeline construction ▪ Increased fugitive dust and emissions during construction and operations ▪ Increased air and GHG emissions (hydrocarbon vapours including BTEX and H_2S) during operation of new storage tanks ▪ Increased indirect GHG emissions during operation of the pump units	7.4.3.4 7.6 7.6.1 7.7
	Acoustic Environment	▪ Trenchless watercourse crossing during pipeline construction ▪ Equipment and vehicle use during construction and operation ▪ Pipeline and facilities operation, including pump units	▪ Increased noise for nearby receptors	7.4.3.4

	Environmental or Socio-Economic Element	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
		▪ Pipeline monitoring and maintenance activities, including aerial patrols, vegetation management and integrity digs, during operation		
Socio-Economic	Human Occupancy / Resource Use (including Fisheries)	▪ Construction and operation including clearing, topsoil salvage, and grading; pipeline trenching, lowering-in and backfilling; watercourse and wetland crossings; and clean-up and reclamation ▪ Construction and operation near residences, communities, Aboriginal communities ▪ Construction and operation across identified trails and recreation areas and in hunting and fishing areas. ▪ Construction and operation on agricultural lands and farm facilities ▪ Equipment and vehicle traffic during construction and operations	▪ Disruption of use of trails and travelways during construction and operation ▪ Decrease in access to recreation areas might reduce recreational hunting and fishing activities ▪ Interruption in access to navigable waters ▪ Decrease in groundwater quantity and quality for rural, domestic and agricultural groundwater use	7.4.3.4
	Heritage Resources	▪ Construction and operation including clearing, topsoil salvage, and grading; pipeline trenching, lowering-in and backfilling; watercourse and wetland crossings; and clean-up and reclamation	▪ Disturbance to, or loss of, previously recorded or unidentified heritage resource sites	7.4.3.4
	Current Traditional Land and Resource Use	▪ Construction activities, including mowing/brushing, vegetation clearing, topsoil salvage, grading, trenching, drilling, backfilling, cleanup and reclamation ▪ Equipment traffic during operations and maintenance ▪ Operations and maintenance activities	▪ Disturbance to, or loss of, previously unrecorded TLRU sites ▪ Disruption of use of trails and travelways ▪ Disturbance to, or interference with, traditional uses, including plant harvesting, hunting and fishing, and site-specific TLU	7.4.3.4 7.4.3.5.2 7.4.3.5.4

	Navigation and Navigation Safety	▪ Pipeline construction at the crossings of navigable watercourses ▪ Water withdrawal for hydrostatic testing	▪ Interference with navigation ▪ Decreased in access for waterway users ▪ Safety of users	7.4.3.4
	Social and Cultural Well-being	▪ Construction, operations, temporary accommodations (work camp), increased traffic	▪ Disruption of community life by temporary workers ▪ Disruption of normal, daily living activities of local residents and land users ▪ Increased demand of temporary population on various community infrastructure, services and amenities	7.4.3.4 7.4.3.5.3
	Human Health/Aesthetics	▪ Construction and operation including: clearing, topsoil salvage, and grading; pipeline trenching, lowering-in and backfilling; watercourse and wetland crossings; and clean-up and reclamation ▪ Operation of new storage tanks at Hardisty Terminal ▪ Operation of new pump units ▪ Pipeline and facilities operation, including pump units	▪ Disruption of normal, daily living activities of local residents and land users ▪ Health of local residents, land users and/or workers may be affected by increased activity in the area, including the operation of new storage tanks, and in the event of an accident or malfunction	7.4.3.4 7.4.3.5.4

Other	Accidents / Malfunctions	▪ Product release, including a line break caused by a third party, during pipeline operation ▪ Fire during construction and operation ▪ Damage to foreign utilities during construction and operation ▪ Transportation accidents during construction and operation	▪ Loss or alteration of soil productivity, surface and groundwater quality, vegetation, wetlands, aquatic species, wildlife habitat, species at risk, air quality. ▪ Injury or mortality to people, wildlife and livestock ▪ Alteration of human health, property, daily activities of local residents and land users, and heritage resources ▪ Increased demands on local emergency, health and social services.	7.4.3.4 7.4.3.5 4
	Effects of the Environment on the Line 3 Replacement Pipeline	▪ Extreme weather events (for example, flooding, fire, earthquake)	▪ Reduced depth of cover over the Line 3 Replacement Pipeline ▪ Damage to infrastructure ▪ Effects on construction and operation schedules ▪ Injury or mortality to people or wildlife	7.4.3.4

7.4.3.2 Mitigation of Potential Adverse Environmental Effects

In its Application, Enbridge identified routine design and standard mitigation, including certain best practices, to mitigate most of the potential adverse environmental effects identified in Table 7-3. For details on all of Enbridge's proposed mitigation, refer to the Application and supporting documentation including Enbridge's EPPs.

Environmental aspects of the routing of the Line 3 Replacement Pipeline are discussed in Section 7.4.3.3. Standard mitigation is discussed in Section 7.4.3.4. Where there are outstanding issues regarding key environmental elements, or the Applicant's proposed mitigation may not be sufficient and additional mitigation may be necessary, a detailed analysis is presented in section 7.4.3.5.

7.4.3.3 Routing of the Line 3 Replacement Pipeline

Under CEAA 2012, paragraph 19(1)(g), the Board's EA must consider alternative means of carrying out the Project that are technically and economically feasible, and the environmental effects of any such alternatives. For linear projects, the primary type of alternative is routing. However, further information on the alternative means of carrying out the Project are described in Section 2.2.4 Economic Feasibility.

Views of Enbridge

Route selection for the Line 3 Replacement Pipeline took into consideration the constraints of the source and delivery control points, as well as the preferred placement adjacent to Enbridge's existing pipeline system. Enbridge stated that given the significant benefits of the route as designed, no other primary routes or sites were considered.

Enbridge's rationale for the selection of its route is detailed in subsection 3.3.1 of Section 3.3 Land Matters.

Views of Participants

Mr. Stewart Crone's views regarding routing are provided in subsection 3.3.1 of Section 3.3 Land Matters.

Pasqua First Nation expressed concerns regarding the routing of the Line 3 Replacement Pipeline through the K+S Potash Canada Legacy Solution Mine footprint in Saskatchewan, since ground settling had been documented in a similar mine in the province. Pasqua wanted to ensure that Enbridge's design and mitigation for the Line 3 Replacement Pipeline through the potash mine area took into consideration the potential for ground settling.

Reply of Enbridge

Enbridge's reply regarding Mr. Crone's views on routing is provided in subsection 3.3.1 of Section 3.3 Land Matters.

Enbridge submitted that it engaged with K+S Potash Canada and that it has reviewed and analyzed plans for a solution mine located in the RM of Dufferin, near Bethune, Saskatchewan. Based on that review and analysis, significant ground subsidence in the area of the Line 3 Replacement Pipeline is not expected to occur for approximately 35 to 40 years. Enbridge stated that it will continue to collaborate with K+S Potash Canada regarding their plans, monitor the potential mine subsidence area once mining activities commence, and take appropriate steps to mitigate potential impacts arising from the solution mine, if any.

Views of the Board

Regarding the concerns of Mr. Crone, and as discussed in Section 3.3.1, routing decisions involve the consideration of many factors. Although the amount of new footprint is a factor that the Board takes into account when assessing the environmental impacts, the Board finds Enbridge's proposed route to be acceptable in the circumstances. As indicated in Section 7.8, the Board is of the view that the Project as routed is not likely to result in significant adverse environmental effects.

Regarding the concerns of Pasqua, the Board is satisfied with the standard mitigation proposed by Enbridge to deal with potential effects of ground subsidence, along with Enbridge's commitment to collaborate with K+S Potash Canada and monitor for potential subsidence in the mine area. The Board expects Enbridge's post-construction monitoring program to include and report on any subsidence issues. Any subsidence issues that develop in the longer term would be addressed through Enbridge's operations and maintenance program.

7.4.3.4 Standard Mitigation

The Board recognizes that many adverse environmental effects are resolved through standard mitigation. Standard mitigation refers to a specification or practice that has been developed by industry, or prescribed by a government authority, that has previously been employed successfully and is now considered sufficiently common or routine that it is integrated into the company's management systems and meets the expectations of the Board.

Views of Enbridge

Enbridge's mitigation measures are contained in its Application, EPPs and associated Environmental Alignment Sheets, and subsequent filings, and were developed in accordance with Enbridge's O&MMs, and the Board's Filing Manual. Industry standard mitigation, specific requirements of regulatory agencies, and input from Enbridge's consultation/engagement program were also used to develop Enbridge's proposed mitigation measures.

Enbridge submitted that most of the potential effects on environmental and socio-economic elements arising from the Line 3 Replacement Pipeline can be readily mitigated by standard environmental mitigation measures common to pipeline projects in similar settings. Among the mitigation strategies to avoid or minimize the effects of the Line 3 Replacement Pipeline, Enbridge is relying in part on the following:

- minimizing the footprint;
- scheduling activities to avoid sensitive periods;
- incorporating experience gained from decades of construction and operation on the mainline corridor;
- implementing a comprehensive environmental protection program; and
- monitoring.

In addition to using relevant information from past projects as described below, Enbridge conducted field studies specific to the Project between 2013 and 2015, which were used to inform its proposed mitigation measures. Enbridge also committed to conducting any outstanding field studies that have not been completed due to re-routes or lack of land access, including soils and wetlands surveys, prior to construction. In addition, pre-construction weed surveys and clubroot sampling will continue into 2016.

Minimizing Footprint
Enbridge plans to minimize the disturbance footprint of the Line 3 Replacement Pipeline by:

- selecting a route that parallels and overlaps the south portion of the existing Enbridge Alberta Clipper RoW, which is mostly adjacent to Enbridge's mainline corridor;
- reducing the amount of permanent easement needed and using existing RoWs for TWS;
- siting permanent above-ground facilities, RSVs and associated communication towers within the boundaries of existing Enbridge terminals and stations, where possible;
- maximizing the use of previously disturbed land or cultivated lands.

Scheduling Activities to Avoid Sensitive Periods
Enbridge does not plan to conduct any instream work (that is, trenched isolated open cut pipeline crossing methods) in any watercourse or other fish-bearing waterbodies within Restricted Activity Periods (RAPs), unless the waterbody is dry or frozen to bottom at the time of construction.

Enbridge will also avoid nesting periods for migratory birds by working outside of the relevant RAP where possible.

Incorporating Past Experience
Enbridge stated that most of the lands associated with the Project have been subject to environmental and socio-economic assessments as part of previous NEB applications. Information to support these assessments has been gathered through literature reviews, consultation with government agencies and a wide variety of supporting studies. Where applicable, Enbridge incorporated and/or referenced this information in its ESA and its supporting studies. For example, in its ESA, Enbridge cited six previous projects completed along the mainline corridor, and their associated ESAs, and about 30 previous projects at relevant facilities and their associated ESAs.

Post-construction monitoring conducted for previous projects has also informed the Project by providing increased knowledge of the potential effects and available mitigation measures that can be relied on to make assessment predictions. Enbridge submitted that the substantial volume of data collected along the Line 3 Replacement Pipeline route has resulted in an increased knowledge base and greater confidence in the effectiveness of the mitigation to be implemented.

Environmental Protection Program
Enbridge's EPPs include a biosecurity management plan that details best practices for preventing the spread of clubroot and weeds, as well as contingency plans to account for unexpected events or atypical field conditions. Examples include contingency plans for:

- the discovery of plants, wildlife, fish, heritage resources and traditional land use sites during construction;
- the discovery of contaminated soils; and
- drilling mud releases.

Enbridge committed to providing updated Facility and Pipeline EPPs and Alignment Sheets prior to construction.

Enbridge said that it will follow all recommendations made by its consultants for all supplementary discipline-specific reports filed with the Board in support of its Application. Enbridge also stated that public and Aboriginal engagement are ongoing for the Project and it commits to considering the implications of any new interests or concerns raised.

As part of its EPP, Enbridge will develop and implement an environmental education program which will be provided to all construction personnel
and visitors.

Monitoring
Enbridge's Environmental Inspectors will monitor the implementation of the EPP mitigation during construction activities and clean-up, monitor contractor compliance with all applicable regulations, and ensure that contractual requirements are met with respect to engineering design, construction, safety and environmental protection.

Following construction, Enbridge will conduct a post-construction monitoring program to assess the success of the EPP mitigation measures and to identify any further measures that may be required. Assessment of any unresolved issue will continue until the issue has been resolved, through the use of adaptive management.

Monitoring will continue through the operations phase of the Line 3 Replacement Pipeline through Enbridge's operations and maintenance program.

Other Standard Mitigation
Enbridge submitted that Project effects to surface and groundwater quality and quantity, as well as to aquatic species and their habitat, will be addressed using standard mitigation outlined in Enbridge's EPPs, by implementing applicable Department of Fisheries and Oceans Canada (DFO) *Measures to Avoid Causing Harm to Fish and Fish Habitat* and by following relevant provincial Codes of Practice. As needed, a subsection 35(2) authorization from DFO will be applied for and appropriate offsetting measures will be developed to ensure compliance with the requirements of the *Fisheries Act*.

Enbridge proposed using standard mitigation to avoid or minimize potential adverse environmental effects on the physical environment, soils, native vegetation including rare plant populations and ecological communities, wetlands, wildlife, species at risk, atmospheric environment, acoustic environment, navigation and navigation safety, and human receptors (as identified in Table 7-3). For species at risk, Enbridge is relying on standard mitigation identified for aquatic species and habitat, wildlife species and habitat, and vegetation, in general, as well as standard mitigation for wetlands.

Views of the Board

To ensure that all general and site-specific mitigation measures are appropriate and will be implemented according to their intent, the Board has imposed conditions on the Line 3 Replacement Pipeline relating to updated EPPs, noise mitigation, breeding bird surveys, a plan for the protection of the environment as a result of pressure testing, and post-construction monitoring reports. Each of these conditions, and related views of participants, is discussed in turn below.

Updated Facilities EPP and Pipeline EPP

Views of Enbridge

Enbridge provided EPPs with its application and committed to providing updated versions of these prior to construction.

Views of the Board

The Board imposes **Certificate Condition 6** and **Section 58 Order Condition 6** requiring Enbridge to file updated Project-specific EPPs for the Section 52 Pipeline and related Facilities, and Section 58 Facilities, respectively. This will ensure that the EPPs

incorporate all relevant updates and additional commitments made by Enbridge during the hearing. It will also help ensure effective communication of all environmental protection procedures and mitigation measures to employees, contractors and regulators. Updated Environmental Alignment Sheets are to be included with the Pipeline EPP, and updated photomosaic maps of each pump station or facility, including environmental features, are to be included with the Facilities EPP. The updated EPPs must be a compilation of all mitigation and monitoring commitments made by Enbridge in its Application as well as additional commitments made during the hearing process. Enbridge is required to file the updated Facilities EPP 60 days prior to construction of the Section 58 Facilities, and is required to file the updated Pipeline EPP 90 days prior to construction of the Section 52 Pipeline and related Facilities. The updated EPPs will be publically available on the Board's website.

Noise Mitigation

Views of Enbridge

Enbridge conducted noise mitigation assessments for pump stations to determine which stations may require additional noise monitoring and mitigation to meet Alberta Energy Regulator (AER) Directive 38 once the pump stations are operational. These assessments indicated potential exceedances of permissible sound level guidelines (AER Directive 38) at four of the existing pump stations: Kerrobert, Glenavon, Glenboro and Gretna. Enbridge committed to conducting supplemental noise monitoring at the most impacted residential receptor location near these stations once they are commissioned to determine if/where noise mitigation will be required, and to implement additional mitigation as needed to ensure that the noise levels meet provincially acceptable levels.

Views of Participants

Health Canada recommended that, where permissible sound levels are expected to be exceeded, and noise reductions via mitigation measures are anticipated, the effectiveness of mitigation measures be verified by follow-up monitoring.

Views of the Board

To verify that noise monitoring at the Kerrobert, Glenavon, Glenboro and Gretna pump stations is conducted once the pump stations are operational, and to obtain a plan for the implementation of any additional noise mitigation measures, the Board imposes **Section 58 Order Condition 26**. The Board also imposes **Section 58 Order Condition 29** to ensure that additional mitigation measures are implemented by Enbridge in order to achieve compliance with AER Directive 38 at those stations that are initially reported as non-compliant.

Breeding Bird Surveys

Views of Enbridge

Enbridge submitted that it will avoid RoW preparation, construction and/or reclamation activities during the migratory bird RAP of April 15 to August 15 to avoid impacting nesting migratory birds, where possible. In the event that the construction schedule changes and RoW preparation or construction activities are planned during the migratory bird RAP, Enbridge stated that it would pre-mow or brush the construction RoW in areas of native vegetation prior to the start of the RAP to discourage nesting. If RoW preparation has not been completed prior to April 15, Enbridge would conduct a nest sweep a maximum of 7 days prior to construction activity to identify active nests. Active nests would be subject to an appropriate buffer until the nest is no longer active. Enbridge's Nest Sweep Protocol (Protocol) is included in its Pipeline and Facilities EPPs. Enbridge indicated that its Protocol applies to RoW preparation, construction, and operations activities.

Enbridge further submitted that it will consult with ECCC prior to conducting any Project activities within the RAP, and that it would update its Protocol as needed.

Views of the Board

There is potential for the Line 3 Replacement Pipeline to disturb birds protected by the *Migratory Birds Convention Act, 1994* or non-migratory birds that are under provincial jurisdiction. While Enbridge committed to certain mitigation measures in the event that the construction schedule changes and RoW preparation or construction activities are planned during the migratory bird RAP, the Board imposes **Certificate Condition 25** and **Section 58 Order Condition 18** to ensure that both migratory and non-migratory birds are included in this commitment. To ensure that Enbridge's Protocol aligns with ECCC guidance for avoidance of incidental take of migratory birds, eggs and nests, and that mitigation is appropriate, these Conditions also require Enbridge to consult with ECCC and the relevant provinces prior to undertaking any pre-construction breeding bird surveys. The Board expects Enbridge to determine the suitable habitats that would be included in the surveys as part of its consultation on survey methodology, and to update its Protocol and EPPs as necessary.

The Board notes Enbridge's commitment to follow its Protocol prior to operations and maintenance activities that occur during the breeding bird RAP. The Board expects that Enbridge will undertake the surveys as committed to, and will implement appropriate mitigation according to the guidance from ECCC and the provinces. The Board does not require Enbridge to file survey reports in these circumstances.

Protection of the Environment-Pressure Testing

Views of Enbridge

Enbridge filed a preliminary pipeline pressure testing plan, and indicated that it would be updated during detailed engineering and design. Pressure tests will use water as the primary test medium and no chemical additives will be used. Twenty-four potential water sources were identified based on a desktop study and information from previous projects. Enbridge will undertake field verification, surveys and suitability tests, obtain landowner consent for access and applicable provincial agency approvals. Enbridge committed to a number of standard mitigation measures including following DFO guidance for use of screens at water intakes, testing discharge water and treating it, if necessary, prior to release, and releasing water in the same watershed from where it was withdrawn. To minimize the total volume of water for hydrostatic testing, all test sections within a given watershed will use the same test water. Enbridge submitted that the specific environmental protection measures to be implemented at each site will be determined following final identification of water withdrawal and discharge sites, and at temporary access locations. Enbridge committed to filing a final report, by spread, with the Board prior to commencement of hydrostatic testing.

In response to a Board IR, Enbridge confirmed that, for hydrotesting of the three new storage tanks to be constructed at the Hardisty Terminal, water will be sourced from, and discharged back to, Enbridge's existing Hydrotest Water Retention Pond which is located within the Terminal boundaries. Water for hydrotesting the tanks will be re-used from one tank to the next, then tested for contamination and filtered or treated, if necessary, before release back to the Retention Pond. Enbridge does not plan to use chemical additives for hydrotesting the storage tanks.

Views of the Board

To verify that appropriate procedures for the protection of the environment will be used for withdrawal and discharge of hydrostatic test water, the Board imposes **Certificate Condition 26** requiring Enbridge to file a final plan for the protection of the environment as a result of pipeline pressure testing activities. The Board expects Enbridge's updated Pipeline EPP to reference this plan. The Board notes that Enbridge does not plan to draw water from natural sources for pressure testing the new storage tanks, therefore the Board's condition applies only to pressure testing the Section 52 Pipeline and related Facilities.

Post-Construction Monitoring

Views of Enbridge

Enbridge stated that following construction, it will conduct a post-construction monitoring program during the first five complete growing seasons after the completion of final clean-up and reclamation, or as required by the NEB. Enbridge will prepare reports to document the results of its program, which will be made publicly available through the NEB website. Enbridge submitted that its post-construction monitoring program will include an assessment of the success of the EPP mitigation measures and recommendations for further measures, if necessary. The program will assess the effectiveness of mitigation measures in restoring the physical environment, landscape and soils, vegetation, watercourses and wetlands to their pre-construction state.

Enbridge stated that it will document issues related to:

- coarse fragments, contour and draining, microtopography and erosion;
- subsoil compaction, topsoil depth, and topsoil/subsoil admixing;
- re-establishment of vegetation, weed introduction/weed habitat creation, and success of mitigation for rare plant population issues along the footprint;
- bank stability, morphology, soil erosion, invasive species, soil productivity, revegetation and the effectiveness of erosion control measures at watercourse crossings; and
- wetland function.

Enbridge committed to tracking all unresolved environmental issues in an Environmental Issues List (EIL). Enbridge's EIL will form the basis of monitoring activities during the post-construction monitoring program. If the program identifies an unresolved issue related to construction, assessment of the issue will continue until the issue has been resolved, through the use of adaptive management.

Views of Participants

AMC raised concerns with regard to monitoring and follow-up programs. It made recommendations about annual reporting, requiring Enbridge to fund an independently-led ex-post (or post hoc) evaluation, developing robust monitoring programs, and identifying actions needed to improve relationships between Enbridge and Aboriginal groups and other Indigenous peoples.

Reply of Enbridge

In response to AMC's concerns, Enbridge stated that its post-construction monitoring program would ensure that mitigation measures are properly implemented and ultimately effective, and noted that recommendations for further mitigation or remediation would be made as warranted during the program. Enbridge described how affected biophysical elements would be monitored

and how issues would be resolved through the use of adaptive management. Enbridge also described the other monitoring programs it has in place to ensure the safe operation of its pipelines and to maintain and monitor them. It noted that Aboriginal input to its monitoring initiatives would be achieved through continuing engagement through the lifecycle of the Project. Enbridge stated that it is exploring potential mechanisms to create and support Aboriginal groups' interest in environmental monitoring.

Views of the Board

In the Board's view, a robust post-construction monitoring program is a fundamental tool and key to ensuring that potential adverse effects have been effectively mitigated. To be satisfied that post-construction environmental monitoring of the Line 3 Replacement Pipeline is thorough and effective and that reports will be developed and filed, the Board imposes **Certificate Condition 36,** which sets out the minimum requirements of Enbridge's post-construction monitoring program. The Board expects that any issues associated with the environmental elements or valued components examined in Enbridge's Application will be included in Enbridge's post-construction monitoring program.

The Board also imposes a condition requiring Enbridge to file an Aboriginal Monitoring Plan. This condition is discussed in Section 6.4 of Chapter 6.

7.4.3.5 Detailed Analysis of Key Environmental Issues

This section contains a detailed analysis of four outstanding issues regarding key environmental elements or circumstances where the Board has determined that Enbridge's proposed mitigation may not be sufficient.

Table 7-4 specifies the definitions for criteria used in evaluating the significance of residual effects. The Board adopted the geographic extent criteria ratings and definitions provided by Enbridge in its Application (Footprint, LSA and Regional Study Area (RSA)), which varied according to the valued component or receptor being considered. Refer to Enbridge's Application for definitions of all geographic extent criteria.

Table 7-4 - Criteria, Ratings and Definitions Used in Evaluating the Likelihood of Significant Effects

Criteria	Rating	Definition
All criteria	Uncertain	When no other criteria rating descriptor is applicable due to either lack of information or inability to predict.
Temporal Extent	Short-term	An effect, either resulting from a single interaction or from infrequent multiple ones, whose total duration is usually relatively short-term, usually lasting in the order of weeks or months.
	Medium-term	An effect, either resulting from a single or infrequent interaction or from multiple interactions each of short duration and whose total duration may not be long-term but for which the resulting effect may last in the order of months or years.
	Long-term	An effect, either resulting from a single interaction of long lasting effect; or from multiple interactions each of short duration but whose total results in a long lasting effect; or from continuous interaction. An effect usually lasting in the order of years or decades.
Reversibility	Reversible	An effect expected to, at a minimum, return to baseline conditions (that is, conditions present when the interaction occurred). The effect would not persist for decades or generations.
	Permanent	An effect that would persist in the order of decades or generations. Some social or cultural effects that persist beyond a single generation may become permanent.
Geographic Extent	Footprint	Effect would be limited to the applicable RoW or facility footprint and any associated TWS.
	Local Study Area (LSA)	Effect would generally be limited to the area where direct Project interaction with the biophysical and human environment could occur. This area varies relative to the receptor being considered.
	Regional Study Area (RSA)	Effect would be recognized in the area beyond the LSA that might be affected on the landscape level. This area also varies relative to the receptor being considered.
Magnitude	Low	Effect is negligible, if any; restricted to a few individuals/species or only slightly affects the resource or parties involved; and would impact quality of life for some, but individuals commonly adapt or become habituated, and the effect is widely accepted by society.
	Moderate	Effect would impact many individuals/species or noticeably affect the resource or parties involved; is detectable but below environmental, regulatory or social standards or tolerance; and would impact quality of life but the effect is normally accepted by society.

Criteria	Rating	Definition
	High	Effect would affect numerous individuals or affect the resource or parties involved in a substantial manner; is beyond environmental, regulatory or social standards or tolerance; and would impact quality of life, result in lasting stress and is generally not accepted by society
Evaluation of Significance	Likely to be significant	Effects that are either: (1) of high magnitude; or (2) long-term, permanent, and of regional extent.
	Not likely to be significant	Any adverse effect that does not meet the above criteria for "significant".

7.4.3.5.1 Watercourse Crossings

Construction and operation of the Line 3 Replacement Pipeline at watercourse crossings has the potential to result in a number of adverse impacts to aquatic species and their habitat, and to water quality and quantity, as indicated in Table 7-3.

Views of Enbridge

The Line 3 Replacement Pipeline route will cross 132 watercourses and drainages, of which 59 are fish-bearing and 73 are not fish-bearing.

Enbridge stated that the majority of named watercourses and other fish-bearing water bodies will be crossed using an isolated method (if water is present), or an open cut method (if dry or frozen to the bottom). Where the recommended crossing method is isolated or open cut, no contingency method is proposed. Nonfish-bearing drainages will be crossed using open cut (if water present) or standard trench (if dry or frozen to bottom); no contingency methods are proposed by Enbridge.

The Qu'Appelle River (SK), South Saskatchewan River (SK), Chapleau Lakes (SK), Souris River (MB) and two irrigation canals (both in SK) will be crossed using trenchless methods. Except in the case of Chapleau Lakes, the contingency plan for each of these crossings is a trenchless crossing at a different location. The contingency crossing locations were not identified by Enbridge. For Chapleau Lakes, the contingency crossing method is isolation (if water present) or open cut (if dry or frozen to bottom).

Enbridge committed to filing with the Board final feasibility reports for the trenchless crossings of the Qu'Appelle, South Saskatchewan and Souris rivers, and for Chapleau Lakes and indicated that it will implement all of the recommendations made by its consultants in these final reports.

Enbridge will implement a number of standard and site-specific mitigation measures to reduce impacts to fish and fish habitat, and to water quality and quantity, at watercourse crossings.

The mitigation measures included in Enbridge's ESA and Pipeline EPP were developed in accordance with the construction standards outlined in *Pipeline Associated Watercourse Crossings, 3rd Edition* and the DFO *Measures to Avoid Causing Harm to Fish and Fish Habitat*.

Enbridge has committed to undertaking additional site-specific mitigation at the Oak Creek (MB-WC42) and Iskwao Creek (SK-WC44) crossings to reduce potential stability issues associated with the crossings being located along meander bends. Enbridge said it is considering a minor realignment of the Iskwao Creek crossing to move the proposed ditchline and workspace further away from the watercourse, reducing the potential for disturbance to the adjacent banks.

Enbridge did not identify any watercourse crossings that are likely to cause serious harm to fish or fish habitat, that would require a *Fisheries Act* authorization. However, Enbridge indicated that, as needed, a *Fisheries Act* authorization will be applied for and appropriate offsetting measures will be developed to ensure compliance with the requirements of the *Fisheries Act*.

Enbridge will monitor watercourse crossings as part of its post-construction monitoring program. The banks and approach slopes of watercourses crossed by isolated or open cut crossing methods will be monitored for bank stability, morphology, soil erosion, invasive species, soil productivity, revegetation and the effectiveness of erosion control measures. An evaluation of the success of riparian vegetation re-establishment will be conducted, including an assessment of weed issues and performance of the seed mix used at watercourse crossings and any enhancement locations.

Enbridge stated that the proposed crossing techniques have taken into consideration the sensitivity of the watercourses, including habitat characteristics, fish species present and instream work windows in addition to the construction schedule and technical and economic feasibility of each crossing.

Enbridge said that its proposed pipeline watercourse crossing methods are expected to avoid serious harm to fish and fish habitat and achieve no net loss of fish, if constructed in a manner that successfully adheres to all of the conditions and mitigation measures discussed in its ESA and in the Pipeline EPP. However, Enbridge noted that should any changes to construction methods or timing (for example, instream construction within timing windows) occur for any watercourses and other fish-bearing waterbodies, further review may be required if serious harm to fish cannot be avoided.

Views of Participants

A number of Aboriginal groups expressed concern for potential impacts to waterways, including impacts to fish, fish habitat, and water quality (see Table 7-1). Most of these concerns related to the potential for accidents and malfunctions during construction at watercourse crossings, or during operation of the Line 3 Replacement Pipeline, and the potential effects of a release on the listed valued components.

The Manitoba Government expressed concern about impacts associated with open cut watercourse crossing methods, noting that these methods can be difficult to stabilize and can be detrimental to fish and fish habitat.

Views of the Board

The Board's analysis of pipeline integrity and the risk of pipeline failure are presented in Chapter 3 of this Report, along with the Board's assessment of Enbridge's emergency management plan. An analysis of potential environmental effects due to accidents and malfunctions is provided in section 7.4.3.5.4.

Pursuant to the Memorandum of Understanding between the Board and DFO, the Board reviews Project activities and refers to DFO any works that will likely result in serious harm to fish and therefore require authorization under paragraph 35(2)(b) of the *Fisheries Act*. Information must be provided to DFO in the form of a draft authorization package according to Schedule 1 of the *Applications for Authorization under Paragraph 35(2)(b) of the Fisheries Act Regulations*. It is the responsibility of the Board to verify that the draft authorization package is complete before Enbridge submits the application to DFO. As per Schedule 1 of the *Applications for Authorization* regulations, where a *Fisheries Act* authorization is required, Enbridge will be required to offset "serious harm".

The Board is of the view that the mitigation measures proposed by Enbridge to be implemented at watercourse crossings will effectively mitigate potential adverse effects to aquatic species and their habitat, and to water quality and quantity. The Board is also of the view that there is low likelihood of serious harm to fish or fish habitat, and therefore it is unlikely that an authorization under paragraph 35(2)(b) of the *Fisheries Act* will be required.

The Board imposes **Certificate Condition 8**, which requires Enbridge to file its Finalized Watercourse Crossing Inventory and Design at least 90 days prior to commencing construction of any watercourse crossing. This will allow sufficient time for the Board to review any changes to watercourse crossing locations or crossing methods, and timing, that are identified as a result of detailed design. For each primary (planned) watercourse crossing where any applicable DFO *Measures to Avoid Causing Harm to Fish and Fish Habitat* will not be implemented, the condition specifies additional information that must be provided.

Where a contingency crossing method is required in place of a proposed primary crossing method, the Board imposes **Certificate Condition 17**, requiring Enbridge to file additional information with the Board prior to commencing construction of the contingency crossing. For any contingency crossing where any applicable DFO *Measures to Avoid Causing Harm to Fish and Fish Habitat* will not be implemented, the Board will assess the need for a *Fisheries Act* Authorization.

The Board reminds Enbridge that in the event of failure of a trenchless crossing, and where the contingency crossing location is outside of the approved Line 3 Replacement

Pipeline construction RoW, Enbridge must apply to the Board for approval of the alternate crossing location and include an environmental assessment of the proposed alternative with its application.

Finally, the Board imposes **Certificate Condition 23**, requiring Enbridge to file a copy of any Authorizations issued by DFO under paragraph 35(2)(b) of the *Fisheries Act*. Enbridge is required to file each Authorization at least 10 days prior to commencing construction of the relevant crossing. The Board notes that, should any Authorization under paragraph 35(2)(b) of the *Fisheries Act* be required, DFO may require up to 150 days to review and issue an Authorization, as per its legislated timeline.

With the mitigation measures proposed by Enbridge and the Board's conditions, the Board is of the view that any residual effects at watercourse crossings as a result of construction or operation of the Line 3 Replacement Pipeline are not likely to be significant. Effects would be of short- to medium-term temporal extent, given that multiple crossings would be constructed, but each crossing construction would be of short duration. Interactions would be less frequent during operations. Effects may be limited to the construction period (for example, increased sedimentation), or may last months or years (for example, until riparian vegetation is reestablished), but would be reversible, and would be limited to the Aquatics LSA. Effects would be of low to moderate magnitude, depending on such factors as the specific crossing location, sensitivity of species present, and habitat quality.

7.4.3.5.2 Aboriginal Traditional Land and Resource Use

The following are some of the views of Enbridge and Participants on potential TLRU-related impacts of the Project. See Section 6.4 of this Report for additional information.

Views of Enbridge

For the purposes of its ESA, Enbridge established a TLRU LSA that encompasses and extends beyond the Footprint to include the LSA boundaries of water quality and quantity, fish and fish habitat, wetlands, vegetation, wildlife and wildlife habitat, and heritage resources, since TLU is dependent upon these resources. Accordingly, the TLRU LSA ranges from a 110 m wide band to a 2 km wide band extending 55 m to 1 km from the centreline (that is, 55m to 1 km on both sides) and is considered to be an area where there is a reasonable potential for Project activities to affect existing TLRU (for example, fishing, hunting and plant gathering). Enbridge assumed in its ESA that TLRU activities including fishing, hunting and plant gathering are potentially practiced since a review of available literature indicates that Aboriginal groups have historically used and presently use Crown lands and resources within the TLRU LSA to maintain a traditional lifestyle.

Enbridge stated that potential effects of the Project on TLRU are not anticipated to extend beyond the TLRU LSA. The Line 3 Replacement Pipeline route crosses provincial Crown land for approximately 53.9 km (5.0%) and Swan Lake I.R. 7 from SKP 1170.4 to SKP 1171.2. The remaining 1,019.6 km (95.0%) of its length is privately-owned land. Therefore, Enbridge did not establish a TLRU RSA.

Views of Participants

AWNTB stated that Project construction may impact some subsistence and gathering activities. File Hills Qu'Appelle Tribal Council (File Hills) stated that the Project could have a large impact on the grounds where they pick sacred medicine and on the grounds where they hold ceremonies. File Hills also expressed concern over impacts that would affect access to clean water, and about respect for sacred artifacts, the medicines, and burial grounds. George Gordon expressed concern that access to traditional lands and resources may be affected by the Project.

MMF identified the following potential impacts on its interests: clearing of woodlots and disturbance of wetlands during construction phase; spills, leaks and malfunctions; effects on wildlife, fish and vegetation, including habitat loss and disruption to spawning areas; monitoring capacity of underwater pipeline; containment of spills in water; drinking water quality concerns; groundwater contamination; monitoring capacity in wetlands; soil contamination; noise concerns; changes in access to harvesting areas and creation of new access routes; effects to sensitive habitat at Oak Lake, Souris River, Glenboro Marsh, Alexander Marsh, Spruce Woods Provincial Park, and Assiniboine River; human health concerns; food security concerns; economic effects on Métis harvesting; effects on agriculture; effects on commercial guiding, trapping and fishing; effects on cultural sites; human population increase; and impacts to species at risk.

Mosquito-Grizzly Bear's Head-Leanman Assiniboine Nation stated that the Project will negatively impact the continuous and ongoing exercise of its activities, practices, traditions, and customs, that are significantly related to the lands impacted by the Project.

Onion Lake expressed concerns about impacts to Buffalo Sage, a traditional medicine that grows along the RoW. Onion Lake also expressed concerns that the Project would have negative impacts on Sounding Lake, Alberta and surrounding area, which is of spiritual significance. Onion Lake submitted that negative impacts on this area include impacts caused by noise, increased traffic, presence of workers, increased access to the area and increased competition for hunting and gathering.

Pine Creek stated that it has concerns regarding how the Project might potentially impact water either through contamination or through creating problems of access to it. Pine Creek stated that it uses water in the Project area for food gathering purposes and navigation.

Roseau River stated that the proposed Project runs through its traditional territory; therefore, it is concerned the Project will cause significant new negative effects and worsen the existing impacts in its traditional territory.

Samson expressed concerns regarding the impacts of the Project on medicinal, ceremonial and traditional food plants, including those that grow in the water. It expressed concern about impact to water quality, HDD, impacts to medicines grown in and near the water and the impacts of potential spills. Samson expressed concern that no meaningful Traditional Land Use Study had been conducted on the area between Sounding Lake and the Neutral Hills.

Stoney Tribal Administration (Stoney) stated that the Project will negatively impact its continuous and ongoing exercise of activities, practices, traditions, and customs.

Treaty 2 Territorial Alliance (Treaty 2) expressed concern that the Project could lead to a decrease in wildlife population, including waterfowl and birds, a decrease in wildlife habitat, and negatively impact natural foods and medicines. Treaty 2 also stated that the Project could have impacts on hunting, fishing and gathering lands and make it difficult to have vehicle access to lands for traditional use, including hunting.

Reply of Enbridge

As stated in Section 6.4 of this Report, Enbridge submitted that it has not confirmed any Project-specific impacts on Aboriginal traditional practices despite a rigorous engagement program. Enbridge also indicated that no Aboriginal group has raised a concern or potential impact to Aboriginal or Treaty rights that has required a change to the route or design of the Line 3 Replacement Pipeline. Enbridge advised that it will evaluate avoidance and mitigation measures if new information becomes available through traditional land use studies and ongoing engagement. Enbridge submitted that the assessment concluded that with the implementation of the mitigation measures proposed by Enbridge, the effects on TLRU would be of medium magnitude, low probability, short-term duration and reversible and, therefore, not significant.

Views of the Board

See Section 6.4 for the Board's views on the potential impacts of the Project on TLRU. Section 6.4 also discusses the conditions the Board imposes on the Project related to TLRU, which require Enbridge to file plans to address outstanding TLU investigations for the Project.

With the mitigation measures proposed by Enbridge and the Board's conditions, the Board is of the view that any residual effects of the Project on the current use of lands and resources for traditional purposes by Aboriginal peoples are not likely to be significant. In the Board's view, effects are likely to be of short to medium-term duration, and possibly reversible. Potential effects are not anticipated to extend beyond the TLRU LSA and would be of low to moderate magnitude. The Board recognizes the very nature of this Project as a replacement, largely along existing linear disturbances, which will minimize the environmental and socio-economic impacts of the Project.

7.4.3.5.3 Temporary Camp

Views of Enbridge

Enbridge submitted that during construction it may require temporary work camps near the Towns of Davidson, Saskatchewan and Hardisty, Alberta.

Enbridge said that it was in the preliminary stages of assessing camp locations and final sites had not been determined. Enbridge indicated that it would know in the first quarter of 2016 whether or not one or more camps would be needed, and committed to provide final details at that time.

Views of the Board

Given the fact that Enbridge has not yet finalized the need for and location of any camps, the Board imposes a condition requiring Enbridge to file a camp-specific effects assessment and proposed mitigation measures, for Board approval, prior to construction of the camps **(Section 58 Order Condition 8)**. Among the details to be filed by Enbridge are the identification of environmental effects, proposed mitigation, and evidence of consultation with relevant parties, including an explanation as to how any issues or concerns of the parties have been addressed. Where a camp is required, the Board expects Enbridge to select a site that maximizes use of previously disturbed land and avoids sensitive environmental features.

With the fulfillment of **Section 58 Order Condition 8**, the Board is of the view that any residual effects related to any temporary work camps are not likely to be significant. Effects would be short-term in duration (limited to the construction period or shortly after), would be reversible once the camp is dismantled and the area reclaimed, and would not extend beyond the LSAs for any valued components. The magnitude of any potential residual effects is expected to be low to moderate, depending on the exact location and size of the camps.

7.4.3.5.4 Spills due to Accidents and Malfunctions

This section explores in detail the potential environmental effects that may occur as a result of a spill due to an accident or malfunction during operation of the Line 3 Replacement Pipeline.

Views of Enbridge

Enbridge stated that while pipelines are considered the safest and most efficient method of transporting large volumes of liquid products over long distances, incidents such as damage to the pipeline, corrosion, operator error and vandalism could occur. Enbridge stated that any accident and malfunction could result in substantial adverse effects to human health, property or the environment, and was of the view that preventing accidents and malfunctions is the most effective way to reduce those risks.

Enbridge submitted that, while accidents and malfunctions are predicted to be unlikely for the Project, it evaluated the potential consequences so that emergency response and contingency planning can be identified to ensure the risk is further mitigated. Enbridge further submitted that, by replacing the Existing Line 3 Pipeline with the Line 3 Replacement Pipeline using better technologies, the net potential effects associated with accidents and malfunctions are expected to decrease.

Enbridge said that there are two potential adverse residual effects that could result from a rupture of the Line 3 Replacement Pipeline during operation: the direct effects of the oil release on the

surrounding environment, and the indirect effects of clean-up activities on the site of the rupture. Enbridge noted that a product release could entail a relatively small leak or, in a severe instance, a failure with potentially substantial effects.

In the case of a minor leak, Enbridge stated that oil would likely be contained within the trench or, in the case of a surface leak, follow the natural drainage pattern of the land until it infiltrates the soil. It predicted that the magnitude of effects to the environment would be low given the small amount of product involved.

Enbridge submitted that a major release would immediately be detected by supervisory control and data acquisition, and the pumps would be remotely shut down, limiting the amount of product released. Depending on the situation, Enbridge stated that the resulting release of oil could be considered to be of high magnitude. Enbridge provided several examples of what it considered to be high magnitude events and they included releases near an ignition source that cause a fire, and releases large in size that occur near human receptors, farming operations, native vegetation, wetlands or watercourses.

Enbridge predicted that the probability of a product release having an effect of high magnitude would be low, when consideration is given to the stringent design of the Project, and Enbridge's monitoring and preventative maintenance programs and emergency response programs. Enbridge stated that, while all assessment criteria were considered when determining the significance of a pipeline failure, the most influential assessment criteria for accidents and malfunctions was probability.

Ecological and Human Health Risk Assessment

Enbridge filed an Ecological and Human Health Risk Assessment (EHHRA) that assessed the potential ecological and human health effects that might be expected following various hypothetical crude oil release scenarios. Enbridge indicated that the EHHRA follows a quantitative and qualitative approach consistent with ecological risk assessment, human health risk assessment best practices, and that follow standard protocols as set out in guidance from the Canadian Council of Ministers of the Environment and Health Canada.

Enbridge's EHHRA modelled hypothetical unmitigated oil releases to calculate the volume of product that could be discharged resulting from a full bore rupture break in the Line 3 Replacement Pipeline and quantitatively modelled the overland and downstream pathways of the releases. Enbridge conducted the modelling using two representative crude oil types with differing properties that would be shipped in the pipeline: Federated Crude (FC), a light sweet crude oil; and, Cold Lake Winter Blend (CLWB), a diluted bitumen. The results of the modelling simulations were used to inform the EHHRA regarding the potential behavior of released FC and CLWB.

Enbridge selected four locations along the Line 3 Replacement Pipeline for modelling: the South Saskatchewan River near Outlook, Saskatchewan; the Qu'Appelle River near Bethune, Saskatchewan; Oak Lake, near Oak Lake, Manitoba; and the Souris River near Oakland-Wawanesa, Manitoba. Enbridge stated that it selected these locations by considering several engineering, environmental and socio-economic risk factors, including areas identified by Aboriginal groups and the general public as being of concern to them, and locations where large

release volumes could potentially enter a watercourse. The EHHRA then focused on the environmental effects that could result from hypothetical release scenarios at these locations.

At each of the four modelled locations, Enbridge's scenarios showed downstream transport of the oil and extensive oiling of the shoreline and in some cases the riparian zone. Enbridge's assessment of high consequence areas indicated that, in the event of a release, there is a risk of potentially significant adverse environmental effects occurring at environmentally sensitive areas, drinking water intakes, Aboriginal lands, and other populated areas.

Enbridge noted that the modelling was useful in determining the first order trajectory and fate of oil, but the program was unable to provide detailed predictions of three-dimensional oil fate and transport. This included such interactions as: the entrainment of oil into the water column, dissolution of soluble fractions of hydrocarbons, emulsion formation, and potential biological effects from exposure to oil. As a result, in the EHHRA, Enbridge supplemented the fate and transport modelling with empirical observations based on case studies of actual crude oil spills.

Enbridge further stated that, while the high consequence area analysis provides an understanding of the potential resources that may be affected under various flow conditions, the modelling assumes that 100% of the shoreline is oiled up to its holding capacity. Enbridge noted this assumption may not be entirely accurate for the products used in its modelling scenarios, and it indicated that there is the potential for some oil to move further downstream than predicted in the modelling. Further, Enbridge noted that river velocity is a key factor in oil transport, and that, in general, if at the time of release higher river velocities occur than was modelled, further transport of oil downstream would result and there would be a potential to affect a greater number of high consequence areas.

From the predicted distribution of crude oil in the environment in each of the rivers, Enbridge further evaluated the interactions between released oil and ecological receptor groups in different seasons and water conditions (frozen or ice-free). The ecological receptor groups included: surface water and sediment quality; aquatic biota; soil quality, terrestrial plant and soil invertebrate communities in riparian areas; amphibians and reptiles; mammals; and birds. Enbridge noted that the spatial extent of environmental effects was found to vary, depending upon the season, river characteristics, and crude oil properties. Enbridge predicted that the spatial extent and magnitude of environmental effects may sometimes be high, but the effect durations were typically predicted to be less than five years, and often 1 to 2 years. Enbridge stated that it considered all environmental effects to be reversible since evidence from the case studies shows that freshwater and riparian ecosystems can recover from oil releases, often within short periods of time (that is, months to several years). Taking all of these factors into consideration, Enbridge was of the view that, while a crude oil release into a freshwater environment could have substantial adverse environmental effects, emergency response and other mitigation measures would help to reduce the spatial extent, severity, and duration of such environmental effects.

Enbridge stated that its human health risk assessment was based on an understanding of the progression of the hazards from a source of risk (for example, petroleum hydrocarbon contaminants in surface water) via environmental pathways to sensitive end-point receptors (for example, humans who may inhale vapours, physically contact released oil, or consume fish or

other foods tainted by the released oil). It noted that its assessment evaluated the risks associated with hypothetical pipeline spills for the same crude oils, spill locations and flow regimes as the ecological risk assessment, and focused on the exposure of people who may be present in the area (for example, residents, recreational users, Aboriginal groups) to chemicals in the released oil during the initial stages of the incident. Human health risks were evaluated for both acute and chronic exposures to both FC and CLWB.

Enbridge noted that the risks from vapour inhalation are highest immediately after an oil release, when large amounts of volatile organic compounds (VOCs) are present in the ambient air. However, it further noted that case studies have shown that air quality can return to below screening levels within a few hours to a few days after the release, as these chemicals disperse into the atmosphere. Enbridge indicated that the chronic risks are dependent on the amount of oil stranded on a shoreline, which in turn is affected by the rate of oil volutization. Enbridge further noted that it was reasonable to assume that exposure would get lower over time as remediation work commenced in the impacted areas. Enbridge concluded that the predicted ratings for chronic risks would likely be higher than the potential risk to individuals following an oil release.

Enbridge submitted that, although the EHHRA demonstrated that there may be risks to human health following a pipeline spill, case studies do not support such effects, especially for chronic exposures. It noted that while people in close proximity to rivers following spills have reported acute effects as a result of exposure to chemicals of potential concern in the crude oil via inhalation of vapours, these effects were reversible once people were evacuated from the affected area, the plume moved downstream, and/or clean-up measures removed the oil. Enbridge was of the view that the lack of reported chronic health effects in case studies is a result of mitigation measures being swiftly implemented to reduce exposures: evacuation, restricted access, physical clean-up of areas affected, ambient air monitoring, surface water monitoring, and public advisories to limit certain activities.

Enbridge stated that an oil release would cause potential adverse effects to public safety, drinking water and water use, land and resource use, traditional land use, and to labour and the economy. These would include the potential for:

- fire and explosion, and potential acute health effects caused by direct contact with released crude oil, or inhalation of vapours;
- effects to drinking water sources, making it necessary to temporarily suspend operation of water intakes used for public or other water supplies and issue advisories regarding water use;
- effects to soil and soil productivity, resulting in loss or damage to crops and pasture;
- disruption to traditional land use activities by Aboriginal peoples;
- effects to water use for several weeks to several years, depending upon the location, size of release and type of oil;
- effects to traditional land use and recreational activities, such as fishing, hunting or trapping;

- effects to commercial and public enterprises and activities that rely on the affected lands and resources, including farming, water uptake for irrigation, tourism, and resort areas; and
- effects to communities as a result of an increase in vehicle traffic during spill clean-up activities on local roads, and an increased demand for accommodations from an influx of recovery crews in the area.

Enbridge was of the view that, with prompt remedial action and oil recovery to reduce the extent of a release, advising local residents to evacuate, and restricting access to the release site, many of the long-term socio-economic effects would be prevented and/or managed even while the hazards persisted. It noted that the magnitude and severity of the effects would depend upon the area or number of individuals affected, as well as the duration of the disruption.

Enbridge committed to continuing to consult with potentially affected stakeholders and Aboriginal groups throughout the life of the Project. In the event of a release, Enbridge stated that emergency response plans and clean-up procedures would be implemented immediately to mitigate any adverse effects. Enbridge stated that monitoring and follow-up would be conducted to confirm effectiveness of clean-up and continued recovery following clean-up.

Enbridge concluded that the EHHRA assessment showed that unmitigated release of oil from the Line 3 Replacement Pipeline could potentially result in significant adverse effects on the environment, on human health, or on the socio-economic environment. However, Enbridge is of the view that such incidents are not likely to occur due to the planning and design of the Project, as well as ongoing inspection and maintenance while the Line 3 Replacement Pipeline is in service, and as a result, the potential significant environmental effects described in its EHHRA would not be likely to occur either.

Views of the Participants

In Mr. Kruk's report submitted by the AMC, he stated that protection of waterways, waterbodies and drinking water/fishery resources from possible contamination by oil pipeline spills, in particular spills of diluted bitumen, is a concern of the AMC. He further noted that special attention must be given by Enbridge and the NEB to high consequence areas. Mr. Kruk made recommendations regarding pipeline design enhancements to better protect waterways at crossing points.

AMC raised concerns that Enbridge had not provided detailed information about potential oil spills, leaks or ruptures, including a quantifiable definition for the probability of a spill.

File Hills expressed concerns related to the effects of spills to water resources.

Health Canada noted that the EHHRA established that both types of transported crude oil modelled contain several polycyclic aromatic hydrocarbons (PAHs). Health Canada recommended that Enbridge provide a rationale for excluding these chemicals from the human health risk assessment as chemicals of potential concern, given their potential health risks.

Health Canada indicated that Enbridge's EHHRA states that in the event of a release, environmentally sensitive areas, drinking water intakes, Aboriginal lands and other populated areas may be at risk of potentially significant adverse environmental effects. However, Health Canada noted that Enbridge's EHHRA does not recognize the boundaries and traditional use of Aboriginal territories, and thus the impacts of pipeline spills may be underestimated. Health Canada suggested that information to describe the spill scenarios and pathways through which the product could enter either surface or ground water sources used by Aboriginal groups be taken into account for designation of water sources in a high consequence area and in assigning factors.

Health Canada also noted that country foods are a major component of the Aboriginal traditional subsistence lifestyle, and effects of country foods on human health were not assessed by Enbridge in its EHHRA. Health Canada noted that the contamination of species that are traditionally harvested would likely cause adverse effects on the community should a spill occur and it stated that the use of country foods should be incorporated in the EHHRA to minimize uncertainties around exposure to chemicals of potential concern.

Health Canada suggested that Enbridge develop mitigation measures to protect human health that quickly and effectively limit human exposure both in the short and long term, consider possible lag times for contaminants to appear in country foods, and identify the proximity of human receptors to the Line 3 Replacement Pipeline RoW as a key criterion for determining response times and actions. Health Canada also suggested that attention be given to the capability of drinking water treatment facilities in the affected areas to be able to handle the chemical loads due to a spill event and continue to meet drinking water guidelines for protection of human health.

Moosomin and Kahkewistahaw expressed concerns related to spills and stated that they expected Enbridge to take responsibility for correcting issues and repairing any damage that may result.

Natural Resources Canada raised concerns regarding leak detection in environmentally sensitive areas or areas where drinking water could be affected by a spill.

Ochapowace expressed concerns related to the effects of potential spills or other catastrophic events related to the Project, to natural resources, waterways and waterbodies, and stated that it expected Enbridge to implement environmental protection measures, which meet and exceed all standard industry practices.

Onion Lake raised concerns related to the effects of potential spills to wildlife and fish populations and habitat, and water quality, and the resulting effect to their traditional use of those resources within or near their traditional territory.

Pasqua stated that it is located downstream from where the Line 3 Replacement Pipeline crosses the Qu'Appelle valley at Lumsden, Saskatchewan, and raised concerns regarding protection of the aquatic life and environmental sustainability for the lower Qu'Appelle valley.

Peguis raised concerns regarding contamination of fish, plants and animals as a result of a spill and the effects of a spill to its food sources. It also expressed concerns related to the downstream effects to Peguis.

Pine Creek raised concerns related to major oil spills and the potential for downstream effects to Pine Creek; the safety precautions that Enbridge would take to ensure there is no environmental contamination; and monitoring and response mechanisms that would be in place to quickly contain spills. It also expressed concerns related to effects of a major spill to waterfowl and animals hunted and trapped by Pine Creek for food, and the mitigation that would be used to protect and alert these animals if a spill occurred.

The Government of Manitoba expressed concerns regarding the risks to aquifers and the municipal drinking water wells that draw from those aquifers, in the event of a spill. In addition, the Province of Manitoba raised concerns regarding the effects of an accident and malfunction to aquatic ecosystems.

The Government of Manitoba requested that Enbridge's commitments in respect of emergency management be made binding by the NEB. These commitments include notifying water system operators in the event of a spill, and implementing certain measures in the event of a spill within the aquifers used as drinking water sources.

Samson raised concerns regarding spills and their potential effects to ecosystems and traditional land and resource use.

Reply of Enbridge

In response to AMC's concerns, Enbridge stated that based on modern technology and operating procedures, the probability of a spill happening on the Manitoban portion of the Line 3 Replacement Pipeline during its 50-year lifetime is extremely low.

Enbridge provided diagrams showing the consequence model results based on data from the Existing Line 3 Pipeline. The diagrams show water crossings and ecologically sensitive areas, locations of remote-sectionalizing valves and associated environmental costs.

In response to the recommendations made by Mr. Kruk, Enbridge noted that his list of considerations is routinely utilized by Enbridge when designing watercourse crossings to ensure that the watercourses crossed are adequately protected from product spills or emissions.

In response to Ochapowace's concerns, Enbridge stated that it has multiple mitigation measures and contingency plans in place to address the unlikely event of a spill. It noted that most spills are small in nature and extent and can be readily mitigated by implementing the appropriate mitigation measures and contingency plans.

In response to Pasqua's concerns, Enbridge submitted that it remained committed to implementing appropriate environmental protection and the safe operation of the Line 3 Replacement Pipeline to protect the water resources in the Lower Qu'Appelle River watershed.

In response to the Government of Manitoba's concerns, Enbridge submitted that the primary means of preventing contamination of aquifers is to prevent potential incidents through pipeline design, including pipeline protection through depth of cover and third-party strike mitigation; pipeline integrity inspections; valve location and spacing; pipeline wall design considerations; and CP. These measures would reduce the potential for pipeline incidents and minimize any potential effects to aquifers should a release occur. In Enbridge's view, the risk of contamination of aquifers is considered extremely low with the implementation of these mitigation measures.

Enbridge submitted that additional mitigation would be implemented in the event of a release to protect groundwater, including the rapid recovery of free product and contaminated material, and remedial measures as needed. At a minimum, Enbridge would install groundwater monitoring wells and sample potable wells in the vicinity of the release to understand subsurface conditions.

Enbridge submitted that the groundwater remedial measures implemented would depend on many site-specific factors including: the product released, volume released, soil type and depth to bedrock, degree of bedrock fracturing, depth to groundwater, and aquifer characteristics. The methods used may include, but not be limited to: in-situ bioremediation, chemical oxidation, air sparging, soil vapour extraction, pump and treat, multi-phase extraction, or natural attenuation. Enbridge stated that it would work with the NEB and applicable regulators to implement a remedial plan based on the *NEB Remediation Process Guide* to assess and remediate any impacts to groundwater.

Views of the Board

The Board acknowledges the concerns expressed by hearing participants related to the environmental effects that may occur as a result of a release from the Line 3 Replacement Pipeline during operations, including concerns regarding the safety and security of food sources, water and other resources used for traditional uses. Safety and environmental protection are of paramount importance to the Board. Sections 3.1 (Engineering Matters) and 3.2 (Emergency Response Matters) of this Report discuss pipeline design, integrity monitoring programs, emergency shutdown systems, emergency preparedness, including communication protocols regarding stakeholders most likely to be affected, and security management. This discussion informs the likelihood of potential accidents and malfunctions that may occur during operation of the Line 3 Replacement Pipeline.

The Board notes that the magnitude and extent of the potential environmental effects resulting from a spill are influenced by many factors, including the type and volume of release, duration, time of year, weather, nature and characteristics of the soils, geology, surface water and groundwater in the vicinity of the release location. Since release locations cannot be predicted with any degree of certainty and the physical environment along the Line 3 Replacement Pipeline varies, any assessment to individual receptors at any point along the Line 3 Replacement Pipeline is hypothetical. That said, the Board is of the view that the information provided in the EHHRA is valuable in further explaining the specific potential adverse effects that could occur as a result of a major release at those locations along the Line 3 Replacement Pipeline where the effects could be

widespread due to the ability of water to transport oil large distances. For this purpose, the Board is satisfied with the methodology used in the EHHRA. The Board expects Enbridge to use the information in the EHHRA to further inform its emergency preparedness and response programs and encourages Enbridge to consider the measures suggested by Health Canada to protect human health.

The Board is of the view that, if a large-scale accident or malfunction were to occur, there would likely be adverse effects to many environmental and socio-economic elements, which could be significant. Specifically, residual adverse environmental effects as a result of such a spill may be long-term in duration, irreversible (permanent), extend over a large geographical area (RSA), and be of a high magnitude. However, with implementation of the design, programs and measures described in Chapter 3, the Board is of the view that a large-scale release, and consequently any residual adverse environmental effects that may occur as a result, are not likely to occur.

The Board acknowledges that the purpose of this Project is to replace an aging pipeline with one built to modern standards: one of the key outcomes of the Project will be enhanced overall safety of Line 3. Accordingly, the likelihood and consequence of a failure of the Line 3 Replacement Pipeline can be expected to be lower than the Existing Line 3 Pipeline.

7.5 Effects Assessment - Decommissioning of Existing Line 3 Pipeline

This section presents the Board's assessment of the effects of decommissioning the Existing Line 3 Pipeline. This includes all Project components applied for by Enbridge under section 45.1 of the OPR.

Specifically, the effects assessment focusses on the potential adverse environmental effects that may occur as a result of:

- the physical activities that would be carried out by Enbridge to prepare the Existing Line 3 Pipeline for a decommissioned state (Decommissioning Activities); and
- the Decommissioned Line 3 Pipeline remaining in-place (during the Decommissioned Period).

7.5.1 Project Components and Activities

While Chapter 1 provides a general description of the Project, Table 7-5 provides further detail regarding the specific Project components and activities involved in the decommissioning of the Existing Line 3 Pipeline.

Table 7-5 - Components and Activities – Decommissioning the Existing Line 3 Pipeline

Project Components and Activities
Decommissioning, in-place, two segments of existing 863.6 mm O.D (NPS 34) oil pipeline, totaling 1067 km from: o Hardisty Terminal (E1/2 19-42-9 W4M) to Cromer Terminal (NE 17-9-28 WPM and SE 20-9-28 WPM); and o NW 9-9-26 WPM to Gretna Station (SE-8-1-1 WPM).
Decommissioning Activities *– Timeframe: Buoyancy control measures are scheduled to be implemented in Q2 2017 before the Existing Line 3 Pipeline ceases operation. All other activities to prepare the Existing Line 3 Pipeline for a decommissioned state are expected to commence in Q2 2018 (once the Line 3 Replacement Pipeline is in-service) and take 12-18 months to complete.*
• Buoyancy control measures will be installed on the Existing Line 3 Pipeline, prior to product displacement, at some watercourse and wetland crossings and locations where soil density is low when water is saturated. Treatment measures will include addition of weights to the Existing Line 3 Pipeline, addition of engineering fill within the pipe, or additional cover material over the Existing Line 3 Pipeline. Activities for all treatments, with the exception of adding cover material, will require daylighting/excavation of pipeline and adjacent pipelines, installation of shoring, installation of the buoyancy control measures, removal of shoring, backfilling, and remediation of site. Temporary access may also be required. • Existing Line 3 Pipeline will be emptied of service fluids. • Existing Line 3 Pipeline will be appropriately cleaned to reduce residual hydrocarbon deposits to the extent practical. • Water withdrawal from natural or non-natural sources, such as fire ponds at Enbridge facilities, will be required to support cleaning of pipeline segments. • Existing Line 3 Pipeline will be physically separated from adjacent active facilities by cutting the pipeline and installing caps and/or installing an engineered fill to create an impermeable barrier to the flow of water. These activities will include: o Closing, permanently disabling and de-energizing 41 mainline valves that share a footprint with other Enbridge facilities; o Isolating the Existing Line 3 Pipeline at 19 pump stations and terminals; o Physically separating crossover piping; and o Segmenting of the Existing Line 3 Pipeline at 53 locations where special treatment has been determined to be warranted to prevent formation of water conduits and protect environmentally sensitive areas. o Depending on the procedures used by Enbridge to conduct the Decommissioning Activities, some degree of ground disturbance is required. Where conventional excavation is required, or cut and cap methods for segmentation or isolation are used, Enbridge expects that ground disturbance activities would take place within a 30 m wide by 12 m long area (0.036 ha). Enbridge plans on using a minimally-invasive procedure to install full containment plugs which may minimize the extent of ground disturbance required to segment the Existing Line 3 Pipeline at environmentally sensitive areas (further details regarding this procedure are provided in Section 7.5.1.1). Where ground excavation is required to access the pipe to conduct the Decommissioning Activities, topsoil salvage, bellhole excavation, backfilling, and clean-up and reclamation will be conducted.
Decommissioned Period *– Timeframe: upon completion of Decommissioning Activities and continuing until the Existing Line 3 Pipeline is abandoned.*

Project Components and Activities
• Enbridge will continue to monitor the Existing Line 3 Pipeline, according to the standards and procedures of its operations and maintenance monitoring program. This will include: o pipeline inspections during patrols; o assessing areas of potential geotechnical instability; o maintaining pipeline signage; o performing depth-of-cover surveys; o monitoring and maintaining the cathodic protection system; o continuing maintenance of the RoW; and o performing enhanced monitoring using ground penetrating radar or equivalent technology at primary highways and active railways. • Remediation activities will be conducted as necessary by Enbridge in the event that a deficiency or area of concern is identified during monitoring.
Abandonment *– Timeframe: As per the requirements of* ***Decommissioning Order Condition 22****.*
• Pursuant to **Decommissioning Order Condition 22**, Enbridge will be required to file an application to abandon the Existing Line 3 Pipeline. The environmental and socio-economic effects of any further activities required for abandonment would be assessed by the NEB at that time.

7.5.1.1 Minimally-Invasive Procedure for Segmentation

As noted in Table 7-5 above, Enbridge is not certain whether it will use conventional cut and cap methods or a new minimally-invasive procedure for segmenting the Existing Line 3 Pipeline. A discussion of these methods, in the context of the EA, is provided below.

Views of Enbridge

Enbridge plans to use a minimally-invasive procedure to install full containment plugs within the Existing Line 3 Pipeline to segment the pipe to avoid or reduce the potential for it to act as a water conduit while in a decommissioned state. Enbridge is conducting a research and development program to evaluate the procedure. Enbridge submitted that, if the research and development program determines that the procedure is not viable, segmentation of the pipe will be accomplished by conventional excavation, and cut and cap methods. Enbridge stated that it will file a report with the NEB for review, prior to implementation, of the minimally-invasive procedure.

Views of the Board

The Board notes that Enbridge assessed the potential effects associated with conventional excavation techniques and cut and cap methods in its environmental effects assessment. The Board is of the view that this is a precautionary and conservative approach, as any potential environmental effects associated with a minimally-invasive technique are likely to be smaller in scale than those associated with conventional methods. The Board has similarly based its EA on the use of conventional excavation techniques.

The Board imposes **Decommissioning Order Condition 10** requiring Enbridge to file a Minimally Invasive Procedure Evaluation Report with the Board, prior to filing a Final Decommissioning Plan **(Decommissioning Order Condition 11)**. Among other things,

this Condition requires that the Report include: the decision-making framework that would be used to decide the circumstances under which the minimally-invasive procedure would be used versus more conventional excavation techniques; an assessment of the potential environmental effects that may arise as a result of using the minimally invasive procedure; and the mitigation measures that would be implemented to protect the environment.

7.5.2 Environmental Setting

Due to their close proximity, the environmental setting for the Existing Line 3 Pipeline is generally consistent with the setting described for the Line 3 Replacement Pipeline (Section 7.4.2), except where the Line 3 Replacement Pipeline route deviates a greater distance from Enbridge's mainline corridor and the Existing Line 3 Pipeline in the vicinity of Regina, Saskatchewan, (SKP 684.5 to SKP 765.2) and Morden, Manitoba (SKP 1201.7 to SKP 1239.9).

Accordingly, where the setting information differs in the vicinity of Regina and Morden, further setting information for select environmental and socio-economic elements is provided below.

Vegetation

Deviation from the Line 3 Replacement Pipeline Route near Regina

- The RM of South Qu'Appelle No. 157 in Saskatchewan is crossed by the Existing Line 3 Pipeline and is not crossed by the Line 3 Replacement Pipeline. Weeds of concern for the RM of South Qu'Appelle include scentless chamomile, nodding thistle, leafy spurge, yellow toad-flax, annual hawksbeard and purple loosestrife.
- There are no known occurrences of vegetation species listed federally by SARA and/or COSEWIC in the vicinity of the Existing Line 3 Pipeline RoW where it deviates from the Line 3 Replacement Pipeline near Regina.
- There are four records of SK CDC-listed rare plant occurrences known within 5 km of the Existing Line 3 Pipeline where it deviates from the Line 3 Replacement Pipeline route near Regina. Two of these occurrences are within the Existing Line 3 Pipeline RoW.

Deviation from the Line 3 Replacement Pipeline Route near Morden

- An occurrence of rough agalinis, a plant listed as Endangered on Schedule 1 of SARA, has been recorded approximately 1.9 km from the Existing Line 3 Pipeline RoW where it deviates from the Line 3 Replacement Pipeline near Morden.
- There are eight records of MB CDC-listed rare plants within 5 km of the Existing Line 3 Pipeline where it deviates from the Line 3 Replacement Pipeline near Morden. None of the occurrences were located on the Existing Line 3 Pipeline RoW; however, some of the records are within a few hundred metres of the RoW.

Water Quality and Quantity

Deviation from the Line 3 Replacement Pipeline Route near Regina

- The Existing Line 3 Pipeline crossings of Wascana and Cottonwood creeks are located further downstream from the Line 3 Replacement Pipeline crossings.
- The Existing Line 3 Pipeline crosses different unnamed tributaries than the Line 3 Replacement Pipeline near Regina.

Deviation from the Line 3 Replacement Pipeline Route near Morden

- The crossings of Thornhill Coulee and Deadhorse Creek by the Existing Line 3 Pipeline are further downstream than the Line 3 Replacement Pipeline crossings.
- The Existing Line 3 Pipeline crosses different unnamed tributaries than the Line 3 Replacement Pipeline near Morden.

Wetlands

Deviation from the Line 3 Replacement Pipeline Route near Regina

- While the wetland setting (for example, classification of wetlands encountered) is similar to that described for the Line 3 Replacement Pipeline, the Existing Line 3 Pipeline, where it deviates from the Line 3 Replacement Pipeline near Regina, crosses two Private Conservation Lands located in S½ 18-17-17 W2M and NE 7-17-17 W2M.

Wildlife and Wildlife Habitat

Deviation from the Line 3 Replacement Pipeline Route near Regina

- Tame, shrub and treed pasture, native prairie, riparian habitat and wetlands are present along the Existing Line 3 Pipeline where it deviates from the Line 3 Replacement Pipeline route near Regina. Based on historical records and the presence of suitable habitat the following species with special conservation status have the potential to occur: burrowing owl (Endangered under Schedule 1 of SARA), chestnut-collared longspur, common nighthawk, ferruginous hawk, loggerhead shrike, Sprague's pipit (all Threatened under Schedule 1 of SARA), bobolink (Threatened by COSEWIC), short-eared owl and northern leopard frog (both Special Concern Schedule 1 of SARA), Baird's sparrow and tiger salamander (both Special Concern by COSEWIC).
- An observation of a burrowing owl has been recorded within 2 km of the Existing Line 3 Pipeline where it deviates from the Line 3 Replacement Pipeline route near Regina.

Deviation from the Line 3 Replacement Pipeline Route near Morden

- Tame pasture, treed pasture, riparian habitat and wetlands are present along the Existing Line 3 Pipeline where it deviates from the Line 3 Replacement Pipeline route near Morden. Based on historical records and the presence of suitable habitat, the following species with special conservation status have the potential to occur: chestnut-collared longspur, common nighthawk, loggerhead shrike (all Threatened under Schedule 1 of SARA), short-eared owl and northern leopard frog (both Special Concern Schedule 1 of SARA), bobolink (Threatened by COSEWIC), Baird's sparrow and tiger salamander (both Special Concern by COSEWIC).
- Observations of both bobolink and chestnut-collared longspur have been recorded within 2 km of the Existing Line 3 Pipeline route where it deviates from the Line 3 Replacement Pipeline route near Morden.

7.5.3 Environmental Effects Analysis

7.5.3.1 Interactions and Potential Adverse Environmental Effects

Table 7-6 identifies the expected interactions between the Decommissioning Activities and the environment, as well as the Decommissioned Line 3 Pipeline and the environment. It also identifies the potential adverse environmental effects resulting from those interactions.

Table 7-6 - Project-Environment Interactions during the Decommissioning Activities (DA) and Decommissioned Period (DP)

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
Biophysical	Physical Environment	DA	▪ No interaction anticipated since ground disturbance would occur within small, isolated areas and is not likely to affect the morphology of distinct physical features	▪ N/A	
		DP	▪ Infilling of the Decommissioned Line 3 Pipeline with soil as it degrades over time ▪ Remedial actions required to address terrain instability issues	▪ Ground subsidence ▪ Terrain instability ▪ Altered topography	7.5.3.3 7.5.3.4.2
	Soil and Soil Productivity	DA	▪ Soils handling (topsoil salvage, excavation, backfilling, topsoil replacement, and reclamation) at locations where Decommissioning Activities will occur ▪ Disturbance of previous site contamination ▪ Spot spills ▪ Equipment and vehicle traffic	▪ Reduced soil productivity due to: o Topsoil/subsoil mixing o Loss of topsoil o Degradation or loss of soil structure o Contamination of soils ▪ Soil erosion ▪ Excessive trench subsidence or remnant trench crown ▪ Spread of clubroot	7.5.3.3 7.5.3.4.1 7.5.3.4.2
		DP	▪ Residual contaminants still present in the pipe ▪ The Decommissioned Line 3 Pipeline acting as a preferred water conduit to transport materials and contaminants ▪ Infilling of the Decommissioned Line 3 Pipeline with soil as it degrades over time	▪ Lowering of soil productivity due to: o Loss of topsoil o Topsoil/subsoil mixing o Contamination of soils	7.5.3.4.1 7.5.3.4.2

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
			▪ Use of vehicles and equipment during monitoring and any required remedial actions ▪ Spot spills		
	Vegetation	DA	▪ Soils handling activities (topsoil salvage, excavation, backfilling, topsoil replacement, and reclamation) at locations where Decommissioning Activities will occur ▪ Spot spills ▪ Equipment and vehicle traffic	▪ Loss of native vegetation ▪ Change to native vegetation composition ▪ Loss or alteration of rare plant populations or rare ecological communities ▪ Weed introduction and spread	7.5.3.3 7.6
		DP	▪ Residual contaminants still present in the pipe ▪ The Decommissioned Line 3 Pipeline acting as a preferred water conduit to transport materials and contaminants ▪ Infilling of the Decommissioned Line 3 Pipeline with soil as it degrades over time ▪ Use of vehicles and equipment during monitoring and any required remedial actions ▪ Spot spills	▪ Disturbance or loss of native vegetation ▪ Loss or alteration of rare plant populations or rare ecological communities ▪ Weed introduction and spread	7.5.3.3 7.5.3.4.2 7.6
	Water Quality and Quantity	DA	▪ Water withdrawal for pipe cleaning ▪ Soils handling activities (topsoil salvage, excavation, backfilling, topsoil replacement, and reclamation) at locations where Decommissioning Activities will occur ▪ Spot spills ▪ Equipment and vehicle traffic	▪ Alteration of natural drainage patterns flow ▪ Reduction in surface water quality or quantity ▪ Alteration of groundwater quantity or flow ▪ Reduction in groundwater quality	7.5.3.3 7.6

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
		DP	▪ Residual contaminants still present in the pipe ▪ The Decommissioned Line 3 Pipeline acting as a preferred water conduit ▪ The Decommissioned Line 3 Pipeline acting as a water conduit to transport materials and contaminants ▪ Infilling of the Decommissioned Line 3 Pipeline with soil as it degrades over time ▪ Use of vehicles and equipment during monitoring and any required remedial actions ▪ Spot spills	▪ Alteration of natural drainage patterns flow ▪ Alteration of surface water and/or groundwater quantity ▪ Contamination of surface and/or groundwater	7.5.3.4.2 7.6
	Aquatic Species and Habitat	DA	▪ Water withdrawal for pipe cleaning ▪ Instream activities during installation of buoyancy control treatments at select watercourse crossings ▪ Spot spills ▪ Use of equipment instream or adjacent to watercourses	▪ Loss or alteration of riparian or instream habitat functions ▪ Fish or mussel mortality or injury ▪ Blockage of fish movements	7.5.3.3 7.6
		DP	▪ Residual contaminants still present in the pipe ▪ The Decommissioned Line 3 Pipeline acting as a preferred water conduit ▪ The Decommissioned Line 3 Pipeline acting as a water conduit to transport materials and contaminants ▪ Loss or erosion of overburden at watercourse crossing causing pipe exposure	▪ Loss or alteration of riparian or instream habitat functions ▪ Fish or mussel mortality or injury ▪ Blockage of fish movements	7.5.3.3 7.5.3.4.2 7.6

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
			▪ Use of equipment instream or adjacent to watercourses during any required remedial actions ▪ Spot spills		
	Wetlands	DA	▪ Water withdrawal for pipe cleaning ▪ Installation of buoyancy control treatments at select wetland crossings, including any dewatering of wetlands ▪ Spot spills ▪ Use of vehicles and equipment adjacent or within wetlands	▪ Loss or alteration of wetland habitat function ▪ Loss or alteration of wetland hydrological function ▪ Loss or alteration of wetland biogeochemical function	7.5.3.3 7.6
		DP	▪ Residual contaminants still present in the pipe ▪ The Decommissioned Line 3 Pipeline acting as a preferred water conduit. ▪ The Decommissioned Line 3 Pipeline acting as a water conduit to transport materials and contaminants. ▪ Use of vehicles and equipment adjacent or within wetlands during monitoring and any required remedial actions ▪ Spot spills	▪ Loss or alteration of wetland habitat function ▪ Loss or alteration of wetland hydrological function ▪ Loss or alteration of wetland biogeochemical function	7.5.3.3 7.5.3.4.2 7.6
	Wildlife and Wildlife Habitat	DA	▪ Ground disturbance, including excavation, backfilling and reclamation, at locations where Decommissioning Activities will occur ▪ Noise, artificial light and human activity ▪ Spot spills ▪ Use of vehicles and equipment	▪ Loss or alteration of wildlife habitat ▪ Reduced habitat availability and effectiveness ▪ Changes to wildlife movements ▪ Wildlife mortality or injury	7.5.3.3 7.6

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
		DP	▪ Residual contaminants still present in the pipe ▪ The Decommissioned Line 3 Pipeline acting as a preferred water conduit ▪ The Decommissioned Line 3 Pipeline acting as a water conduit to transport materials and contaminants ▪ Use of vehicles and equipment during monitoring and any required remedial actions	▪ Loss or alteration of wildlife habitat ▪ Reduced habitat availability and effectiveness ▪ Changes to wildlife movements ▪ Wildlife mortality or injury	7.5.3.3 7.5.3.4.2 7.6
	Species at Risk or Species of Special Status and Related Habitat	DA	▪ Ground disturbance, including excavation, backfilling and reclamation, at locations where Decommissioning Activities will occur ▪ Noise, artificial light and human activity ▪ Spot spills ▪ Use of vehicles and equipment	▪ Loss or alteration of vegetation species at risk or their habitat ▪ Potential effects as described under Aquatic Species and Habitat, to aquatic species at risk ▪ Potential effects as described under Wildlife and Wildlife Habitat, to wildlife species at risk	7.5.3.3 7.6
		DP	▪ Residual contaminants still present in the pipe ▪ The Decommissioned Line 3 Pipeline acting as a preferred water conduit ▪ The Decommissioned Line 3 Pipeline acting as a water conduit to transport materials and contaminants ▪ Use of vehicles and equipment during monitoring and any required remedial actions	▪ Loss or alteration of vegetation species at risk or their habitat ▪ Potential effects as described under Aquatic Species and Habitat, to aquatic species at risk ▪ Potential effects as described under Wildlife and Wildlife Habitat, to wildlife species at risk	7.5.3.3 7.6
	Atmospheric Environment	DA	▪ Use of vehicles and equipment	▪ Increase in air emissions ▪ Increase in GHG emissions	7.5.3.3 7.6
		DP	▪ Use of vehicles and equipment during monitoring and any required remedial actions	▪ Increase in air emissions ▪ Increase in GHG emissions	7.5.3.3 7.6

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
Socio-economic	Acoustic Environment	DA	▪ Use of vehicles and equipment	▪ Increase in nuisance noise	7.5.3.3
		DP	▪ Use of vehicles and equipment during monitoring and any required remedial actions	▪ Increase in nuisance noise	7.5.3.3
	Human Occupancy/Resource Use (including Fisheries)	DA	▪ Use of construction equipment and vehicles during ground disturbance ▪ Ground disturbance, including clean-up and reclamation ▪ Water withdrawal and release during pipeline cleaning	▪ Sensory disturbance of local residents and land and resource users (from nuisance air emissions, noise and visual effects) at locations disturbed by Decommissioning Activities ▪ Disruption of outdoor recreation experience, disruption of outfitting, hunting, fishing, ranching and farming activities of land users, including Aboriginal groups at select locations disturbed by Decommissioning Activities	7.5.3.3
		DP	▪ Use of vehicles and equipment during monitoring and any required remedial actions ▪ The Decommissioned Line 3 Pipeline acting as a water conduit to transport materials and contaminants ▪ Ground disturbance and ground subsidence as a result of infilling of the Decommissioned Line 3 Pipeline ▪ Loss of cover over the Decommissioned Line 3 Pipeline causing pipeline exposure	▪ Disruption of outdoor recreation experience, disruption of outfitting, hunting, fishing, ranching and farming activities of land users, including Aboriginal groups where the Decommissioned Line 3 Pipeline has infilled ▪ Accidents resulting from ground subsidence where the Decommissioned Line 3 Pipeline has infilled ▪ Alteration of surface water supply and quality	7.5.3.3 7.5.3.4.2

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
				▪ Alteration of well water flow and quality due to an alteration of groundwater quality or quantity ▪ Accidents resulting from exposed pipeline	
	Heritage Resources	DA	▪ Ground disturbance at locations where Decommissioning Activities will occur	▪ Disturbance to, or loss of, previously unidentified heritage resource sites	7.5.3.3
		DP	▪ Ground disturbance required for any remedial actions	▪ Disturbance to, or loss of, previously unidentified heritage resource sites	7.5.3.3
	Current Traditional Land and Resource Use	DA	▪ Decommissioning Activities, including use of vehicles and equipment, and ground disturbance	▪ Disturbance to, or loss of, TLRU sites ▪ Disruption of use of trails and travelways ▪ Disturbance to, or interference with, traditional uses, including plant harvesting, hunting and fishing, and site-specific TLRU	7.5.3.3
		DP	▪ Use of vehicles and equipment during monitoring and any required remedial actions ▪ Ground disturbance and ground subsidence as a result of Infilling of the Decommissioned Line 3 Pipeline ▪ Loss of cover over the Decommissioned Line 3 Pipeline causing pipeline exposure	▪ Disturbance to, or loss of, TLRU sites. ▪ Disruption of use of trails and travelways ▪ Disturbance to, or interference with, traditional uses, including plant harvesting, hunting and fishing, and site-specific TLRU	7.5.3.3 7.5.3.4.2
	Navigation and Navigation Safety	DA	▪ Instream activities required during installation of buoyancy control treatments ▪ Water withdrawal during pipe cleaning	▪ Interference with navigation ▪ Decreased access for waterway users ▪ Safety of users	7.5.3.3 7.5.3.4.2

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
		DP	▪ Loss or erosion of overburden at watercourse crossing causing pipe exposure	▪ Interference with navigation ▪ Decreased access for waterway users ▪ Safety of users	7.5.3.4.2
	Social and Cultural Well-being	DA	▪ A small workforce is expected to use the services of local communities over a short period to conduct Decommissioning Activities	▪ Disruption of community life by temporary workers ▪ Disruption of normal, daily living activities of local residents and land users ▪ Increased demand of temporary population on various community infrastructure, services and amenities	7.5.3.3
		DP	▪ A workforce to undertake any required remedial actions	▪ Disruption of community life by temporary workers ▪ Disruption of normal, daily living activities of local residents and land users ▪ Increased demand of temporary population on various community infrastructure, services and amenities	7.5.3.3
	Human Health/Aesthetics	DA	▪ Decommissioning Activities, including use of vehicles and equipment, and ground disturbance ▪ Ground disturbance, including excavation, backfilling and reclamation, at locations where Decommissioning Activities will occur ▪ Water withdrawal during pipe cleaning	▪ Disruption of normal, daily living activities of local residents and resource users at locations disturbed by Decommissioning Activities	7.5.3.3
		DP	▪ Use of vehicles and equipment during monitoring and any required remedial actions ▪ The Decommissioned Line 3 Pipeline acting as a water conduit to transport materials and contaminants	▪ Contamination to surface water and/or groundwater. ▪ Health of local residents, land users and/or workers may be affected in the event of an accident due to ground subsidence	7.5.3.3 7.5.3.4.1 7.5.3.4.2

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
			▪ Ground disturbance and ground subsidence as a result of infilling of the Decommissioned Line 3 Pipeline ▪ Residual contaminants still present in the pipe ▪ Loss of cover over the Decommissioned Line 3 Pipeline causing pipeline exposure		
Other	Accidents/ Malfunctions	DA	▪ Damage to nearby pipelines or foreign utility lines as a result of a line strike during Decommissioning Activities (which may result in a release of product or a fire) ▪ Use of vehicles and equipment ▪ Transportation accidents	▪ Loss or alteration of soil productivity, surface and groundwater quality, vegetation, wetlands, aquatic species, wildlife habitat, species at risk, air quality ▪ Injury or mortality to people, wildlife and livestock ▪ Alteration of human health, property, daily activities of local residents and land users, and heritage resources ▪ Increased demands on local emergency, health and social services	7.5.3.3
		DP	▪ Line break of nearby pipelines or foreign utility lines, due to terrain instability resulting from degradation of the Decommissioned Line 3 Pipeline over time (which may result in a release of product or a fire) ▪ Transportation accident as a result of ground subsidence or pipe exposure ▪ Use of vehicles and equipment during monitoring and any required remedial actions	▪ Loss or alteration of soil productivity, surface and groundwater quality, vegetation, wetlands, aquatic species, wildlife habitat, species at risk, air quality ▪ Injury or mortality to people, wildlife and livestock ▪ Alteration of human health, property, daily activities of local residents and land users, and heritage resources ▪ Increased demands on local emergency, health and social services	7.5.3.3 7.5.3.4.2
	Effects of the	DA	▪ Extreme weather events (for example, flooding,	▪ Reduced depth of cover over the pipeline	7.5.3.3

	Environmental or Socio-Economic Element	Phase (DA or DP)	Description of Interaction (or Why No Interaction is Expected)	Potential Adverse Environmental Effect	Mitigation Discussed in:
	Environment on the Project		fire, earthquakes)	▪ Damage to infrastructure ▪ Effects on construction and operation schedules ▪ Injury or mortality to people or wildlife	
		DP	▪ Extreme weather events (for example, flooding, fire, earthquakes)	▪ Reduced depth of cover over the pipeline ▪ Damage to infrastructure ▪ Injury or mortality to people or wildlife	7.5.3.4.2

7.5.3.2 Mitigation of Potential Adverse Environmental Effects

In its Application, Enbridge identified standard mitigation, including certain best practices, to mitigate many of the potential adverse environmental effects identified in Table 7-6. Refer to Enbridge's Application and supporting documentation, including its Pipeline EPP, for details on all of Enbridge's proposed mitigation.

Standard mitigation is discussed in Section 7.5.3.3 below. Where there are outstanding issues regarding key environmental elements, or the Applicant's proposed mitigation may not be sufficient and additional mitigation may be necessary, then a detailed analysis is presented in Section 7.5.3.4.

7.5.3.3 Standard Mitigation

The Board recognizes that many adverse environmental effects are resolved through standard mitigation. Standard mitigation refers to a specification or practice that has been developed by industry, or prescribed by a government authority, that has been previously employed successfully and is now considered sufficiently common or routine that it is integrated into the company's management systems and meets the expectations of the Board.

Decommissioning Activities

Views of Enbridge

Enbridge's mitigation measures are provided in its Pipeline EPP and Decommissioning Environmental Alignment Sheets. Enbridge filed updates to its Decommissioning Environmental Alignment Sheets in May 2015, which showed new treatment locations based on additional information it had obtained since filing its Application. Enbridge noted that it expects to further revise and refine its decommissioning strategy and plan, as a result of: additional data collection, assessment and integration during detailed engineering; ongoing data collection from Enbridge's Integrity Program; post-construction monitoring results of other Enbridge pipelines within the mainline corridor; mitigation of identified contaminated sites adjoining the Existing Line 3 Pipeline; and stakeholder consultation.

Enbridge submitted that its Pipeline EPP compiles into a single document all of the environmental protection measures to be implemented during the construction of the Line 3 Replacement Pipeline, the decommissioning of the Existing Line 3 Pipeline, as well as contingency plans related to environmental matters during construction. It further noted that many of the potential effects associated with the physical process of decommissioning a pipeline are similar to the potential issues associated with pipeline construction, specifically those related to activities that entail surface disturbance (those are, clearing, topsoil salvage, excavation, backfilling, topsoil replacement, revegetation, temporary access, spill prevention and clean-up). However, Enbridge committed to providing the Board with a separate Decommissioning EPP which clearly defines the proposed activities and mitigations associated with Decommissioning Activities.

Enbridge provided the following commitments with regard to choosing and siting Decommissioning Activities along the Existing Line 3 Pipeline RoW to avoid or minimize potential environmental effects:

- whenever possible, the implementation of treatment measures will be sited in order to create the least possible ground disturbance;
- once the locations where treatment areas have been determined, all appropriate biophysical surveys will be conducted to supplement existing information as needed;
- all segmenting locations will require approval of Enbridge's Environmental Inspector or Environment Project Lead and be reviewed from an environmental and engineering perspective by Enbridge and its representatives prior to their implementation;
- once the locations of Decommissioning Activities are identified, supplemental aquatic, vegetation, wildlife and wetland assessments will be conducted, as needed;
- the proposed segmentation decision-making process will ensure the protection of identified species at risk primarily by avoiding segmentation in areas where species at risk have been documented, to the extent feasible; and
- in the event that a species at risk is observed during Decommissioning Activities, Enbridge will implement the mitigation measures outlined in its Application and its O&MMs.

Enbridge does not anticipate extensive travel will be required along the RoW for Decommissioning Activities. Equipment used for Decommissioning Activities would travel along existing access routes or along the existing Enbridge RoWs for short distances to access the treatment locations.

Further details regarding the decommissioning treatments to be implemented on the Existing Line 3 Pipeline as part of Enbridge's decommissioning plan are discussed in Section 4.3.1 of this Report.

Views of the Board

The Board notes that Enbridge's Pipeline EPP is primarily focused on the construction of the Line 3 Replacement Pipeline. In the Board's view, the decommissioning chapter within the EPP is not explicit enough in identifying which mitigation measures, management plans or contingency plans would apply to decommissioning of the Existing Line 3 Pipeline, and under what circumstances. The Board is of the view that this may create uncertainty in the implementation of the EPP by Enbridge's staff and contractors.

The Board notes that Decommissioning Activities are not expected to commence until 2018 and the details of the Enbridge's decommissioning plan, including the specific mitigation measures, may be further refined before that time.

The Board is satisfied that the decision-making criteria provided by Enbridge in selecting treatment options for decommissioning the Existing Line 3 Pipeline appropriately consider environmental protection, and that Enbridge's proposed mitigation measures will address any potential environmental effects arising from the implementation of these

measures as part of Enbridge's finalized decommissioning plan. However, to provide additional clarity and transparency, and ensure that all potential site-specific environmental effects will be appropriately mitigated, the Board imposes **parts f), g)** and **h) of Decommissioning Order Condition 11** and **parts e), f) and g) of Decommissioning Order Condition 6.**

Specifically, **parts f), g) and h) of Decommissioning Order Condition 11** require the following to be included in Enbridge's Final Decommissioning Plan:

- **part f)** – Enbridge's final framework for evaluating the potential effects to the environment of the Decommissioning Activities including the circumstances for conducting advance field work and studies, and for applying additional measures to mitigate any identified potential environmental effects;

- **part g)** – the results of any advance field work conducted, identification of any potential environmental effects that may occur as a result of the Decommissioning Activities, and the measures that would be taken by Enbridge to avoid or reduce those effects; and

- **part h)** - a decommissioning-specific EPP (Decommissioning EPP) to ensure that appropriate mitigation is in place to avoid or reduce potential environmental effects.

Parts e), f) and g) of Decommissioning Order Condition 6 are similar to **Decommissioning Order Condition 7,** but are focused specifically on the implementation of buoyancy control measures.

The EPPs in both plans must be comprehensive and cover general and site-specific mitigation related to all environmental elements. In those cases where there may be multiple ways of achieving the desired outcome, the EPPs should state the goal, mitigation options and clear decision-making criteria for choosing which option to apply under what circumstances. Where a mitigation option is mandatory it should be clearly stated. Updated environmental alignment sheets are to be included in each plan.

Further views of the Board related to **Decommissioning Order Conditions 11** and **6** are provided in Section 4.3.1.

Decommissioned Period

Views of Enbridge

Enbridge stated that it would continue to monitor the Existing Line 3 Pipeline RoW and address any concerns that arise in the future according to the standards and procedures of its operations and maintenance program.

In the event that a deficiency, or area of concern, is discovered during the monitoring program, Enbridge stated that it would conduct a risk assessment to determine if remediation activities are necessary. Remedial actions include providing additional depth of cover, buoyancy control, pipeline protection, cladding, matting, or drainage control, and would be conducted according to Enbridge's O&MMs.

Enbridge described its decision-making framework for choosing treatment options to address concerns at watercourse crossings where the pipeline is at risk of exposure, and where lack of depth of cover or buoyancy issues are a concern during the Decommissioned Period. Enbridge provided an evaluation and relative comparison of the potential environmental effects associated with applying each treatment.

Section 4.3.2 of the Report discusses Enbridge's monitoring program for the Decommissioned Line 3 Pipeline in further detail.

Views of the Board

To ensure that Enbridge's plan for ongoing monitoring of the Decommissioned Line 3 Pipeline is transparent to all interested parties, the Board imposes part i) of **Decommissioning Order Condition 11**. This requires Enbridge to include in its Final Decommissioning Plan a description of the parameters that will be monitored during the Decommissioned Period.

As discussed in Section 4.3.1 and 4.3.2, as well as in Section 7.5.3.4.2 of the EA below, the Board imposes **Decommissioning Order Conditions 12** and **21**, which require Enbridge to design a scientifically robust program to monitor and verify the effectiveness of the treatment measures in reducing the identified environmental risks of leaving the pipeline in-place during the Decommissioned Period, and report those results to the Board and stakeholders.

As discussed in Section 4.3.2, the Board also imposes **Decommissioning Order Condition 18**, which requires Enbridge to notify the Board, in certain circumstances, of planned remedial and adaptive management actions that are required during the Decommissioned Period. This Condition also requires Enbridge to file an action plan for Board approval in the event that greater than 100 m of the Decommissioned Line 3 Pipeline will be removed. The action plan must include an assessment of the potential environmental effects that may result from implementing the remedial action; the results of any field surveys conducted; and an action-specific EPP outlining the mitigation measures that would be implemented to avoid or minimize those effects.

For activities in the Decommissioned Period that do not meet the criteria outlined in **Decommissioning Order Condition 18**, the Board finds it appropriate for Enbridge to use the procedures and standard mitigation measures outlined in its O&MMs.

7.5.3.4 Detailed Analysis of Key Environmental Issues

In the following subsections, two issues are explored in detail: historical contamination, and the potential residual effects as a result of the Decommissioned Line 3 Pipeline remaining in-place. Refer to Table 7-4, in Section 7.4.3.5, for the definitions of the criteria used in evaluating the significance of residual effects.

7.5.4.3.1 Historical Contamination

Views of Enbridge

Enbridge provided the locations of all known historical contaminated sites within Enbridge's mainline corridor as a result of releases from the Existing Line 3 Pipeline and other pipelines within the corridor. The information provided included the year the release occurred, the volume released and the status of remediation. As well, Enbridge provided a list of other known contaminated sites in proximity to the Existing Line 3 Pipeline RoW.

Enbridge stated that it would continue to manage all contaminated sites within its mainline corridor, according to the *NEB Remediation Process Guide*. If previously unidentified contamination related to the Existing Line 3 Pipeline is discovered, Enbridge indicated that those sites would be managed and remediated in a similar manner to the known sites. Enbridge noted that, if it has outstanding contaminated sites on the Existing Line 3 Pipeline RoW at the time of abandonment of the last operating pipeline in the corridor, it would remediate those sites to the applicable provincial and/or federal guidelines according to the standards of the day.

Views of the Participants

George Gordon noted that Enbridge provided a list of known areas of contamination along the Existing Line 3 Pipeline but stated that site-specific release and remedial reports for each known occurrence are not available. It stated it has concerns that Enbridge lacks commitment in assessing and remediating pre-existing contamination associated with the Existing Line 3 Pipeline. George Gordon noted that decommissioning of the Existing Line 3 Pipeline offers a unique opportunity to address these concerns in a safe manner without compromising project schedules or pipeline operation.

Ochapowace also raised concerns that Enbridge has not committed to resolving and remediating past contamination along the Existing Line 3 Pipeline. It requested that Enbridge present and implement a comprehensive action plan to address and remediate any sites where past contamination had occurred, particularly with respect to past contamination that has taken place near or on their lands in the Pilot Butte area of Saskatchewan.

Reply of Enbridge

In response to George Gordon's concerns, Enbridge stated that it takes responsibility for its contaminated sites and re-iterated its commitments for assessing and remediating both known and newly identified contaminated sites in the future along the Existing Line 3 Pipeline RoW.

In response to Ochapowace's concerns with regard to past contamination along the Existing Line 3 Pipeline, Enbridge stated that it completed a review of the list of historical contaminated sites within the mainline corridor in the vicinity of the Pilot Butte, Saskatchewan and notes that a spill occurred on 20 May 1999 in that area. Enbridge submitted that it has completed remediation of contaminated soils and groundwater at the site.

In response to Ochapowace's request for a comprehensive action plan to address and remediate past contamination, Enbridge stated that the Existing Line 3 Pipeline is located on lands titled to Enbridge in fee simple within a corridor bounded by Ochapowace reserve lands on two sides. It noted that its decommissioning plan, as applied for in its Application, covers this area.

Views of the Board

The Board notes that Ochapowace continues to have outstanding concerns with respect to the effectiveness of the remediation of past contamination on its lands. The Board expects Enbridge to work with Ochapowace to address those concerns. If resolution cannot be achieved, the NEB has an Issue Resolution Process in place and encourages the Ochapowace to use this process to work with Enbridge and the Board to resolve its outstanding remediation concerns.

The Board notes that Enbridge has committed to following the NEB's *Remediation Process Guide* and that the Board will continue to have regulatory oversight of the Decommissioned Line 3 Pipeline to ensure that any historical contamination issues are addressed, whether they are presently known, or are identified during Decommissioning Activities or the Decommissioned Period. The Board also notes that it has the authority to order further remedial work when necessary, if it is not satisfied that a site has not been appropriately remediated.

The Board is of the view that, with the appropriate remediation, the potential residual adverse effects resulting from historical contamination are not likely to be significant. For known historical contaminated sites, any residual effects are expected to be low to moderate in magnitude, reversible in the short- to medium-term, and be limited in extent (that is confined to the Footprint or LSA). For those areas of contamination that remain undetected, the Board recognizes that any potential residual effects would likely be permanent, but be of low to moderate magnitude depending on receptors and exposure pathways and limited in extent (that is, confined to the Footprint).

The Board's views regarding the sufficiency of Enbridge's decommissioning treatments for reducing the potential spread of historical contamination as a result of the Existing Line 3 Pipeline acting as a water conduit can be found in Section 4.3.1 of this Report.

7.5.4.3.2 Potential Residual Effects as a Result of the Decommissioned Line 3 Pipeline Remaining In-Place

Notwithstanding Enbridge's treatment measures for the decommissioning of the Existing Line 3 Pipeline, there remains the potential for environmental effects to occur during the Decommissioned Period. These effects may result from residual contamination within the pipeline, pipeline collapse and ground subsidence, the pipeline acting as a conduit, and pipeline exposure. An analysis of these issues is provided below.

Views of Enbridge

Enbridge stated that it drew on experiences with abandonment, as well as decommissioning, when predicting the potential residual effects associated with decommissioning the Existing Line 3 Pipeline in-place, but noted that there have only been a few examples of major pipeline decommissioning or abandonment projects. Enbridge relied on its professional judgment and industry and regulatory position papers to inform its effects assessment.

Residual Contamination within the Decommissioned Line 3 Pipeline

Enbridge noted that, once the Existing Line 3 Pipeline has been emptied of service fluids, cleaned and decommissioned, residual contaminants may still be present.

Enbridge stated that development and implementation of an effective cleaning program for the Existing Line 3 Pipeline, consisting of operational pre-cleaning, fluids displacement and effective cleaning of the pipeline, is its primary mitigation measure to reduce potential effects associated with residual contamination. Enbridge noted that, with the successful implementation of the proposed mitigation measures and in consideration of each potential residual contaminant, the likelihood that potential residual contaminants would occur at concentrations that could cause a threat to the environment or human health is considered low.

Enbridge indicated that the Decommissioned Line 3 Pipeline may act as a conduit by which residual contamination could be transported. The magnitude of the potential residual effects associated with the transport of contaminants would be primarily determined by the cleanliness of the pipeline following Decommissioning Activities and the soil conditions at the inflow and outflow points.

Enbridge's effects assessment predicted that residual contaminants left within the Decommissioned Line 3 Pipeline may cause future soil and water contamination, and could result in adverse effects to soil productivity, surface water and groundwater, riparian or instream habitat, wetland habitat or function, vegetation, and wildlife, including species at risk. Enbridge predicted that any potential residual effects would occur gradually over time, be rare in frequency, and low in magnitude and probability since cleaning of the pipeline is expected to reduce residual contaminants to a level that would not affect these valued components. It noted that the spread of contamination may extend beyond the Existing Line 3 Pipeline RoW. Enbridge noted that, once identified, remedial work and restoration of the valued component affected would resolve any effects within ten years. Enbridge stated that its confidence in its assessment was low to moderate for the Decommissioned Line 3 Pipeline, based on its understanding of the cause-effect relationships.

Pipeline Collapse and Ground Subsidence

Enbridge's effects assessment predicted that ground subsidence, resulting from infilling of the Decommissioned Line 3 Pipeline, could cause effects to the physical environment, reduce soil productivity through erosion and drainage issues, alter natural surface drainage patterns and cause localized flooding, erosion and pooling, and affect human occupancy and resource use. Enbridge also noted that pipe collapse and subsequent ground subsidence could disturb or rupture nearby buried utilities, disturb transportation corridors such as highways and railways, or cause the pipe to become exposed. It noted that any of these outcomes could lead to further adverse biophysical and human health effects if an accident were to occur as a result.

Enbridge expected that pipe infilling would occur gradually over time and subsequent ground subsidence would occur intermittently and repeatedly over the lifespan of the Existing Line 3 Pipeline. It predicted that any accidents resulting from ground subsidence would occur rarely. Enbridge stated that the probability of ground subsidence would be high, but expected that most potential adverse effects, with the exception of those that could occur as a result of an accident, would be low in magnitude and within a tolerable range, be reversible, and take less than a year to remediate. It noted that effects resulting from an accident would range from being immediately reversible to permanent, since some accidents may result in minor injuries to people or wildlife, while others could cause permanent injury or death to people or wildlife. Enbridge predicted the probability of ground subsidence occurring along the Decommissioned Line 3 Pipeline to be high, but expected that the probability of an accident or malfunction associated with ground subsidence would be low. Enbridge's confidence in its assessment was moderate based on its understanding of the cause-effect relationships.

Decommissioned Pipeline Acting as a Conduit

Enbridge noted that cleaning the pipeline and applying isolation and segmentation to reduce local topographic variation will reduce the likelihood that the Decommissioned Line 3 Pipeline acting as a preferred water conduit, to the extent that valued components are affected, or contaminants are transferred at concentrations that could cause a threat to the environment or human health.

Enbridge's environmental assessment noted that, by acting as a preferred water conduit, the Decommissioned Line 3 Pipeline could adversely affect soil and soil productivity, surface and groundwater quality, fish and fish habitat, wetlands, vegetation, wildlife and wildlife habitat, species at risk, human occupancy and resource use, and human health. Enbridge indicated that there is a potential for the release of water from inside the pipeline to surface water or for water to drain from a watercourse or waterbody into the pipeline and through it to another catchment area nearby. Enbridge noted that this has the potential to adversely affect the hydrological characteristics of surface water. In addition, Enbridge stated that there is a potential for contaminants from within the Decommissioned Line 3 Pipeline to be released through the water conduit effect into a waterbody.

Enbridge predicted that any potential residual effects of the Decommissioned Line 3 Pipeline acting as a preferred water conduit would occur gradually over time, be rare in frequency, and be low to moderate in magnitude and probability since segmenting the pipeline would reduce its ability to act as a conduit. Enbridge noted that the period to reverse effects may extend into the long-term, and in the case of a static groundwater source, could be permanent. Once identified, it

predicted that for some valued components, remedial work would resolve those effects in the short- to medium-term. Enbridge stated that its confidence in its assessment was low to moderate for the Decommissioned Line 3 Pipeline, based on its understanding of the cause-effect relationships.

Enbridge also stated the Decommissioned Line 3 Pipeline may act as a conduit to transport contaminants, but noted it would be unlikely since, for the effect to occur, it requires both the presence of residual contamination and the ability for the contaminant transfer. However, if it were to occur, Enbridge predicted the magnitude of any residual effects to be low since cleaning of the pipeline is expected to reduce residual contaminants to a level that would not cause further substantive effects. Enbridge also expected that, depending on the length of time required to identify soil and water contamination and the extent and location of the contamination, any residual effects would be reversible in the short- to long-term. Once any areas of contamination are identified, Enbridge stated that remedial work would resolve potential effects to most elements in the short- to medium-term. It noted, however, that if surface or groundwater were contaminated, the period to reverse effects to water quality may extend beyond 10 years (long term). Enbridge stated that its confidence in its assessment was low to moderate, based on its understanding of the cause-effect relationships.

Pipeline Exposure

Enbridge stated that pipeline exposure may occur as a result of buoyancy forces acting on a pipeline, erosion and slope instability, and scour of overburden at watercourse crossings as a result of natural watercourse dynamics and events such as flooding. It further noted that exposed pipe is vulnerable to accelerated corrosion and may present a safety hazard or pose a physical barrier to land use, navigation, wildlife movement and fish migration.

Enbridge considered the effects of an exposed Decommissioned Line 3 Pipeline to the environmental elements of fish and fish habitat, wetlands, navigation and navigation safety, and accidents and malfunctions. Enbridge stated that exposed pipe in a watercourse could cause alteration or loss of riparian or instream habitat and result in adverse effects to fish and fish habitat. In addition, Enbridge noted that exposed pipe could alter the bed, shores and hydrology of a wetland and may negatively affect wetland habitat function. Enbridge stated that there is a high probability that pipeline exposure would occur while the Decommissioned Line 3 Pipeline remains in-place, but predicted that the events would be intermittent and sporadic. It was of the view that any effects to fish and fish habitat or wetlands would be of low magnitude and reversible in the medium- to long-term, since regular inspections would identify any instances of pipe exposure and remedial actions would be applied to rectify the issue. Enbridge's confidence in predicting the effects was low to moderate based on understanding of the cause-effect relationship.

Enbridge's effects assessment also indicated that an exposed Decommissioned Line 3 Pipeline within a navigable waterbody could pose a public safety risk to users of that waterbody. It predicted that the probability is low since it is unlikely that an accident resulting in harm to the navigable waterway user would occur, given that Enbridge plans to conduct depth of cover surveys at a frequency of at least every 10 years, which would identify areas of exposed pipe. Enbridge stated the magnitude of any effects would range from low to high depending upon the

severity of the accident. Enbridge assessed the reversibility of any effects to be long-term, but noted that once an exposed pipeline is discovered, it would take less than one year to remediate. Enbridge's confidence in predicting these effects is low to moderate based on understanding of the cause-effect relationship.

Views of Participants

MMF stated that soil and water contamination was the greatest perceived risk by participants of its traditional land use study regarding the decommissioning of the Existing Line 3 Pipeline. It noted that respondents were worried that corroded material from the Decommissioned Line 3 Pipeline would cause a variety of environmental issues including soil and water contamination, and ultimately affect wildlife and human populations.

Michel raised concerns that Enbridge's effects assessment did not include the potential effects of the Decommissioned Line 3 Pipeline remaining in-place on Aboriginal rights.

Views of the Board

The Board is of the view that, overall, Enbridge's plan for implementing treatment measures to reduce environmental and socio-economic risks of the Existing Line 3 Pipeline remaining in-place is reasonable and comprehensive (as discussed in Section 4.3.1 of this Report). However, the Board notes that the treatment measures have been largely untested by the pipeline industry and there is therefore limited knowledge of the long-term effects of leaving a large-diameter pipeline in-place. The Board also notes Enbridge's low to moderate confidence in predicting the potential environmental effects that may occur as a result of leaving the Decommissioned Line 3 Pipeline in-place. Therefore, the Board is of the view that monitoring of the treatment measures is required to confirm their effectiveness in avoiding or reducing environmental effects. This includes any effects to Aboriginal traditional land and resource use.

Accordingly, the Board imposes **Decommissioning Order Condition 12**, which requires Enbridge to design and file with the Board, for approval, a scientifically robust program to monitor and verify the effectiveness of the treatment measures. The condition also requires Enbridge to provide the criteria and thresholds that would be used to determine when adaptive measures, such as additional treatments or pipeline removal, would be implemented based on the monitoring results and any reported events. In addition, the Board requires Enbridge to report the monitoring results and any adaptive management responses implemented by Enbridge in response to those results, as per the requirements of **Decommissioning Order Condition 21**.

The Board agrees with Enbridge's identification of four main risks associated with decommissioning the Existing Line 3 Pipeline in-place: residual contamination, pipeline collapse and ground subsidence, the pipeline acting as a water conduit, and pipeline exposure. The Board is also supportive of the treatments proposed by Enbridge and notes the unprecedented scale of the decommissioning of the Existing Line 3 Pipeline and likely value of the monitoring program to future decommissioning and abandonment projects. Further

discussion of the environmental and socio-economic risks of leaving the Decommissioned Line 3 Pipeline in-place and the Board's views regarding the suitability of the decommissioning treatments being applied by Enbridge to reduce those risks are provided in Section 4.3 of this Report.

The Board acknowledges Enbridge's commitment to continuing to monitor the Decommissioned Line 3 Pipeline RoW as part of its operations and maintenance program and undertake remedial actions as necessary to address any concerns that arise from the Decommissioned Line 3 Pipeline remaining in-place. As noted in Section 4.3 of the Report and in Section 7.5.3.3 above, the Board imposes **Decommissioning Order Condition 18**, which requires Enbridge to notify the Board, in certain circumstances, of planned remedial and adaptive management actions that are required during the Decommissioned Period. This Condition also requires Enbridge to file an action plan for Board approval in the event that greater than 100 m of the Decommissioned Line 3 Pipeline will be removed. The action plan must include an assessment of the predicted environmental effects that may occur as a result of implementing the remedial action; the results of any field surveys conducted; and an action-specific EPP outlining the mitigation measures to avoid or minimize those effects.

The Board finds that, with the implementation of Enbridge's decommissioning treatments and mitigation measures, continued monitoring of the Decommissioned Line 3 Pipeline, and the requirements of **Decommissioning Order Conditions 12** and **21**, most residual effects once identified would be of low to moderate magnitude, limited to the LSA, reversible, and have a short to medium temporal extent. For those residual effects that remain undetected below ground, the Board is of the view that the duration of any effects may extend long-term and may not be reversible (permanent), but would likely be low in magnitude and limited to the LSA.

With regard to an accident resulting from pipeline exposure or ground subsidence, the Board is of the view that the magnitude of any potential effects would range from being low to high depending on the severity of the accident, limited in extent to the Footprint or LSA, be reversible in the short-term if no injuries occurred, or be long-term and not reversible (permanent) if the injuries are severe or result in death. However, the Board is of the view that severe accidents are unlikely to occur since Enbridge's continued monitoring of the Decommissioned Line 3 Pipeline RoW should detect areas with inadequate depth of cover and ground subsidence before they become significant enough to cause a severe accident.

Accordingly, the Board is of the view that the potential residual adverse effects associated with the Decommissioned Line 3 Pipeline remaining in-place are not likely to be significant.

7.6 Cumulative Effects Assessment

This assessment considers the impacts of the residual effects associated with the Project as a whole (construction and operation of the Line 3 Replacement Pipeline and the decommissioning of the Existing Line 3 Pipeline), in combination with the residual effects from other projects and activities that have been or will be carried out. Total cumulative effects are considered within appropriate temporal and spatial boundaries and ecological context.

The existing landscape in which the Project is situated has been highly altered, mainly as a result of widespread agricultural activities. The following activities have also contributed to regional cumulative effects: rural and urban residential development, transportation development (for example, roads and railways), oil and gas exploration and development, power generation (for example, wind and hydroelectric energy), and utilities (for example, transmission and gas distribution lines). Enbridge's mainline corridor forms part of the existing landscape.

In its Application, Enbridge provided a list of reasonably foreseeable developments with the potential to contribute to further cumulative effects. They include:

- agricultural production plants in Edmonton and Camrose;
- a grain factory in Regina;
- about 59 proposed residential and commercial development projects, mainly in SK;
- over 40 transportation and infrastructure projects, mainly in AB and SK, including road works and bridge works;
- 55 utilities and renewable energy projects in SK and MB, including expansion of Buffalo Pound Non-Potable Water Supply System, two new transmission lines totaling 143 km, Qu'Appelle Dam Hydro Project, and Manitoba-Minnesota Transmission Project;
- up to six large diameter, long distance oil pipeline projects and their associated facilities;
- minor oil and gas development projects, including over 260 well sites, 29 pipelines, and 45 facilities projects; and
- three potash mines in SK.

In addition to these specific projects, long-term land use planning in the region indicates that agricultural development is likely to continue indefinitely.

In its Application, Enbridge acknowledged that, since the Project is located within a continuously disturbed environment, total cumulative effects may already be significant for several biophysical elements, with or without consideration of the Project or other reasonably foreseeable developments in the Project area. For specific valued components, it noted the following:

- Water quantity and quality – it is estimated that almost 80% (2,595,239 ha) of the aquatics RSA (3,259,948 ha) has experienced disturbance affecting stream flow, natural drainage patterns and water quality. Disturbance within the aquatics RSA is primarily a result of agriculture (for example, runoff, irrigation use), dams, and urban areas (for example, residential and commercial development, sewage effluent). Enbridge indicated that these activities may already have led to localized cumulative effects of high magnitude to water quality and quantity. Enbridge estimated that the Project would disturb an additional 0.01% (447 ha) of the aquatics RSA, and other foreseeable developments would disturb a further 0.004% (122 ha).
- Fish and fish habitat – it is estimated that 59.8% (53,376 ha) of the total riparian area within the aquatics RSA (89,249 ha) is disturbed. Disturbance within the aquatics RSA is primarily a result of agriculture and urban areas, and similar to water quantity and quality, Enbridge indicated that these activities may already have led to localized cumulative effects of high magnitude to fish and fish habitat. Enbridge estimated that the Project would disturb an additional 0.02% (14 ha) of riparian areas within the aquatics RSA and other foreseeable developments would disturb a further 0.01% (13 ha).
- Vegetation - much of the RSA has already been altered by agricultural activities and other developments in the region. Native vegetation currently only represents about 15.6% (36,335 ha) of the vegetation RSA (232,258 ha). Enbridge estimated that the Project would contribute 790 ha of new disturbance to native vegetation within the RSA and other foreseeable developments would contribute a further 40 ha of disturbance. While native vegetation can regenerate in disturbed areas, continuing agricultural development activities will likely continue to prevent recovery of native vegetation. For vegetation species at risk, Enbridge noted that the magnitude of cumulative effects is already high without contribution of the Project and other foreseeable developments.
- Wetlands - a high percentage of wetlands in the prairies have already been lost due to activities such as land drainage to increase agricultural land, and construction of roads and communities. It is estimated that 26.8% (879,247 ha) of the wetland RSA (3,275,098 ha) is comprised of wetlands, of which it is estimated that more than 50% (487,281 ha) have already been disturbed. Enbridge estimated that the Project would disturb an additional < 0.1% (101 ha) and other foreseeable developments would disturb a further <0.1% (442 ha).
- Wildlife - existing anthropogenic disturbance and agricultural pasture lands account for almost 80% (2,592,722 ha) of the Wildlife RSA (3,254,146 ha). The extent and frequency of this disturbance has exceeded levels at which the ecosystems in the Project area are capable of supporting some wildlife populations with natural biodiversity and abundance. Enbridge estimated that the Project would disturb an additional 447 ha of wildlife habitat and other foreseeable developments would disturb a further 222 ha. For wildlife species at risk, Enbridge noted that high levels of existing habitat disturbance has likely resulted in, or at least contributed to, cumulative effects that affected the viability or self-sustaining capability of populations, causing them to be listed under SARA, indicating exceedance of a threshold.

- Air Quality - in the vicinity of the Hardisty Terminal, Enbridge's initial air quality assessment of the proposed Project storage tanks predicted a possible exceedance of Alberta Ambient Air Quality Objective (AAAQO) for the Baseline Case. Enbridge also noted that some background measurements of particulate matter and ozone have occasionally approached their AAAQOs in the Project's air quality RSA.

Enbridge indicated that agriculture and urban development (including roads, cities, towns and communities) accounted for most of the disturbance, by area, in the relevant study areas. For example, Enbridge stated that in the aquatics RSA, crops and pasture land comprise 2,472,442 ha (about 95%) of the existing disturbed area (2,595,239 ha), cities, towns and communities comprise 35,221 ha (1.4%) and roads comprise 50,056 ha (1.9%). Pipelines and combined commercial, industrial and oil and gas facilities currently make up 3,755 ha (0.14%) and 11,078 ha (0.45%), respectively, of the existing disturbed area in the aquatics RSA. Enbridge further indicated that, with respect to total cumulative effects, disturbance associated with some existing and reasonably foreseeable developments and activities, such as pipelines and transmission lines, is likely to be largely temporary, while the disturbances associated with agriculture, transportation and urban development are or may be permanent.

Views of the Board

The Board recognizes that the Project will largely take place in an agricultural setting within and adjacent to a long-established pipeline corridor. The Board is of the view that this minimizes potential overall environmental effects by largely avoiding undisturbed areas and focusing potential Project effects to areas previously disturbed by other activities.

The Board also recognizes that, mainly due to widespread agriculture, some valued components in the relevant Project study areas are already experiencing some significant adverse cumulative effects. These valued components include water quantity and quality, fish and fish habitat, vegetation, wetlands, wildlife and wildlife habitat, and species at risk. The Board also notes that municipal and regional land-use plans indicate support by local governments and communities for continued agriculture in the Project area. As a result, the Board is of the view that these valued components are likely to continue to experience ongoing cumulative effects.

For most valued components, the Board is of the view that many of the potential construction-related Project effects would interact with effects from other projects and activities only for a limited time and be reversible in the short- to medium-term. For example, the Project's construction-related noise or dust may interact with noise or dust generated from other activities in the Project area, but these interactions would cease upon completion of Project construction. As another example, in the case of water quality, increased suspended sediment concentrations due to instream activities and from erosion on approach slopes and banks during Project construction may interact with similar effects from other activities, but these interactions would no longer occur once watercourse crossing construction has been completed, vegetation has been established

on the watercourse approach slopes and banks, and other sediment control measures have been implemented.

The Board also recognizes that some adverse residual environmental effects are likely to occur as a result of the Decommissioned Line 3 Pipeline remaining in-place, and it is of the view that some of these effects could interact with effects from other projects and activities over the long-term and, in some cases, be permanent. However, the Board is of the view that they would likely be low in magnitude and localized in extent. For example, if residual contaminants left within the Decommissioned Line 3 Pipeline contaminate nearby soils as the pipeline degrades over time, the contribution of this effect to cumulative effects at that time for the valued components within the soils LSA and aquatics RSA would likely be minor, but permanent.

The Board imposes several conditions requiring Enbridge to monitor the effects of the Project on the environment in order to ensure the magnitude, duration and extent of any residual effects are minimized. These include **Certificate Condition 36** and **Decommissioning Order Condition 12**. The Board expects Enbridge to pay special attention to the Project's contribution to those valued components currently experiencing significant cumulative effects when evaluating the success of its mitigation in its post-construction monitoring program and Decommissioning Treatment Monitoring Program. Where monitoring identifies challenges in recovery for any particular valued component, the Board also expects Enbridge to apply sufficient additional adaptive management measures to fully address any residual effects. In addition, regarding wetlands, the Board expects Enbridge to ensure the Project achieves no net loss to wetland function. With respect to native vegetation, the Board notes the threat of weeds to vegetation re-establishment and reminds Enbridge to conduct thorough post-construction weed monitoring, in addition to keeping its overall weed management program up to date for the life of the Project, as required by the OPR. If the results of the post-construction monitoring program and Decommissioning Treatment Monitoring Program indicate that the Project's residual effects are not fully addressed, the Board may require Enbridge to conduct more frequent monitoring, longer term monitoring, or impose further mitigation.

The Board is of the view that the Project area will continue to experience ongoing cumulative effects on valued components, and that these effects are mainly the result of widespread agriculture. Moreover, the Board is of the view that the evidence suggests that any potential cumulative effects associated with the Project are generally overshadowed and subsumed within the greater agricultural land use changes that is a key determinant of cumulative effects in the Project area.

The Board has identified two areas that warrant detailed discussion of potential cumulative effects: air quality (Section 7.6.1) and vegetation species at risk (Section 7.6.2).

7.6.1 Air Quality

Air quality at a given location is influenced not only by the Project's effects, but by the combination of emissions from a broader area. The following is a detailed analysis of air quality issues at Enbridge's Hardisty Terminal, as it relates to the construction of the three new storage tanks.

Views of Enbridge

The Project includes construction of three new storage tanks at Enbridge's Hardisty Terminal, which is part of the Hardisty Complex: an oil product storage and handling terminal located approximately 4 km southeast of the Town of Hardisty, Alberta. Enbridge stated that the Hardisty Complex contains a total of 96 existing or approved storage tanks, operated by various different companies.

Regional air quality in the vicinity of Enbridge's Hardisty Terminal is driven by the cumulative emissions of the tanks currently operating at Hardisty Complex, and is influenced by the local topography and meteorological conditions. Enbridge's evidence indicated that operation of the three new storage tanks at its Hardisty Terminal will result in evaporative working losses (tank loading/unloading) and standing losses (vapour escape) and include vapours of various reduced sulphur and hydrocarbon compounds. Enbridge stated that emission rates from the storage tanks are expected to vary depending on the operating parameters, ambient temperature, wind speed and the type of product stored in the tank.

Enbridge provided an Air Quality Assessment in support of its Application, based on AERMOD dispersion modelling. In order to determine the effect on ambient air quality associated with emissions from the Hardisty Complex including the three proposed storage tanks, dispersion modelling was conducted for three cases: Baseline Case (existing or approved tanks at Hardisty Complex), the Project Alone Case (three storage tanks forming part of the Project), and the Application Case (Baseline Case plus Project Alone Case). Hydrogen sulphide (H_2S), mercaptans, and benzene were selected as the key substances of interest because of the potential for H_2S and mercaptan to cause nuisance odours and benzene's potential to affect human health.

Enbridge's modelling background included continuous H_2S concentration data obtained from the Sodbusters and Crones air quality monitoring stations located approximately 3 km northwest and southeast, respectively, of Enbridge's Hardisty Terminal.

The results of the air quality assessment indicated that all maximum predicted ground-level concentrations of H_2S, mercaptans and benzene associated with the Project Alone Case are well within the relevant regulatory criteria, with the areas of maximum of effect predicted to occur along the Hardisty Complex property boundary. However, the assessment predicted that the maximum 24-hour ground-level H_2S concentration for Baseline Case (current conditions) would be 4.89 μ/m^3, which exceeds the AAAQO of 4 μ/m^3. With the addition of the predicted emissions from the Project, the maximum ground-level H_2S concentration for the Application Case was predicted to be 4.92 μ/m^3. Enbridge predicted the exceedances to occur along the northern edge of the Hardisty Complex property boundary, with a frequency of one day over the five-year modelling period. Enbridge indicated that there are no AAAQO for benzene and

mercaptans, but the modelling results indicated that the predicted maximum ground-level concentrations of these substances were well below the regulatory criteria for other provinces (for example, Ontario), where available. For all other modelling scenarios, the maximum concentrations of the substances of interest are predicted to occur near the fenceline of the Hardisty Complex, and are expected to be well below AAAQO and other regulatory criteria at sensitive receptors, including nearby residents and the Town of Hardisty.

In May 2015, Enbridge filed an updated Air Quality Assessment, which incorporated several updates to the dispersion modelling methodology used in the initial assessment. The updated assessment indicated that the maximum predicted ground-level concentrations for all substances of interest and modelling scenarios are within acceptable regulatory limits.

Enbridge stated that its rationale for conducting the updated modelling was to make the tank emission estimates more realistic. In the updated assessment, Enbridge stated that the peak and average emissions from each tank were estimated based upon expected vapour concentrations from representative measurements, rather than using tank headspace concentration limits, as done in the initial assessment. Enbridge indicated that the emission inventory for the Hardisty Complex was updated to incorporate more representative tank vapour composition measurements. An additional future modeling case (Future Development Case) was also added to the assessment scenarios so as to assess the cumulative effects of the Project with respect to regional air quality when considering other publicly-announced proposed tanks in the Hardisty Complex. Enbridge noted that this worst-case scenario was developed through review of operating conditions and feedback from each terminal operator to provide a realistic case of the maximum possible emissions from the tanks at the Hardisty Complex.

The results of Enbridge's updated air quality assessment for the Baseline Case, Application Case and Future Development Cases indicated that the maximum 24-hour ground-level H_2S concentration for all three cases will be 3.29 μ/m^3, which is lower than the relevant AAAQO of 4 μ/m^3.

Enbridge indicated that the maximum predicted ground-level concentrations for H_2S, mercaptans and benzene in the updated assessment are generally located along the Hardisty Complex property boundary. The predicted concentrations at sensitive receptors, including local residences and the Town of Hardisty, are all predicted to be less than the relevant regulatory criteria for ambient air quality.

Enbridge indicated that it works collaboratively with industry partners throughout the Hardisty complex to address public complaints and discuss and coordinate initiatives that affect the complex. It noted that one of the key initiatives to address cumulative effects to air quality is the creation of an air shed monitoring network. To that effect, in 2013, members of the Hardisty complex began consultation with the province of Alberta regarding the formation of a group to monitor air quality. Enbridge anticipated that the air shed monitoring group will be in place by 2016 and indicated that through the new network, H_2S, Total Reduced Sulfur, and VOCs will be monitored throughout the year and results will be compared to the AAAQO on an ongoing basis. As a member of the Hardisty Complex, Enbridge said that it will be a sponsor of the air shed monitoring group and will receive monitoring results.

Enbridge noted that odour complaints are addressed according to the *Hardisty Mutual Aid Partnership Call Around Procedure for Odor Complaints*. The procedure ensures all industry partners at the complex are notified of an odour complaint and the responsible party takes appropriate actions. Results of the call out are also communicated back to the person who made the complaint.

Enbridge stated that it would continue to monitor ambient BTEX (benzene, toluene, ethylbenzene and xylenes) and H_2S concentrations at the Sodbusters and Crones monitoring stations. Enbridge submitted that its current monitoring program would collect adequate data to verify the dispersion model predictions, and that, upon operation of the proposed tanks for one year, it would analyze the ambient monitoring data from the monitoring stations for both the years before and the year after start-up of the proposed expansion. The differences in maximum, average and other statistics would then be compared for the two time periods to determine observed changes in air quality associated with the Project. Enbridge noted that those observations would be compared to the changes in air quality that were predicted based upon the modelling.

Enbridge submitted that modelling outputs will have a degree of error due to uncertainties in the data and simplification in modelling algorithms, and it is of the view that it is not appropriate to use the exact assessment predicted concentrations as a management threshold given the fact that the maximum predicted concentrations were below the levels associated with possible adverse effect on air quality. Enbridge proposed instead that the AAAQO be used as the threshold for implementing additional mitigation. It noted that the AAAQO is still protective of the potential for effects on air quality or potential for odour effects as well as offering a buffer that better accounts for the uncertainty associated with the model predictions.

Views of Participants

Health Canada submitted that, while there is low likelihood for acute and chronic health effects due to Project-related air emissions based on Enbridge's assessments, Enbridge did not provide a characterization of potential human receptors (for example, closest residences, Aboriginal residents/traditional resource users, recreational users) near the Hardisty Terminal and a rationale for the receptors chosen in its air quality assessments. Health Canada is of the view that underestimations or uncertainties in the assessments with respect to air pollutant concentrations resulted in a considerable degree of uncertainty in the predicted health risks. Health Canada supported the use of monitoring and mitigation measures to control and minimize the Project's contribution to airborne emissions. Health Canada strongly encouraged that risk management measures not be confined to meeting standards, but targeted towards reducing population exposure to the extent technically and economically feasible.

Views of the Board

The Board notes Enbridge's involvement in the development of an air shed monitoring network in the Hardisty area and encourages Enbridge to continue to work with the other members of the Hardisty Complex and the Province of Alberta to collectively manage cumulative effects of tank emissions to local air quality. The Board understands that any

conditions it imposes are independent from any conditions imposed by the Province under Alberta's *Environmental Protection and Enhancement Act*, and is of the view that the Board conditions would add value to the Province's comprehensive network of air quality monitoring stations and the collective management of regional air quality. The Board expects its regulated companies to minimize their individual contributions to local air emissions and work proactively with other companies at the Hardisty Complex to ensure that emissions are well-below AAAQO (relevant significance threshold).

Over the course of the hearing, Enbridge submitted two Air Quality Assessments, whose differing conclusions illustrated to the Board the inherent uncertainty associated with predicting emissions and associated ground-level concentrations using computational models. The Board is of the view that verification of the modelling results during tank operation is appropriate given this level of uncertainty, and imposes **Section 58 Order Conditions 20** and **28**.

Enbridge is required to file a Hardisty Terminal Air Emissions Monitoring Plan **(Section 58 Order Condition 20)** for detecting and recording fugitive H_2S and VOC (benzene) emissions during operation of the Project tanks since the modelling results for Baseline and Application Cases in Enbridge's initial air quality assessment predicted a possible exceedance of AAAQO. As part of this plan, Enbridge would install vapour monitoring and gas detection equipment at locations where maximum concentrations were predicted by the air quality assessments; describe how the data collected would be used to verify the accuracy of those predictions; illustrate the feedback mechanisms that would allow the monitoring data to be used to inform operating decisions; and provide details of how Enbridge would use the data collected to assist in preventing the exceedance of AAAQO. In addition, Enbridge is required to report annually on the monitoring and any adaptive management responses implemented in response to the monitoring results **(Section 58 Order Condition 28)**.

Notwithstanding the inherent uncertainties associated with modeled worst-case predictions, the Board is of the view that remaining below the AAAQO is protective of regional air quality. In the Board's view, while long-term in duration, the potential residual effects to air quality at the Hardisty Terminal would be low in magnitude and reversible in the future. With the implementation of **Section 58 Order Conditions 20** and **28** to address the uncertainty associated with the model predictions, the Board is of the view that the regional air quality at the Hardisty Terminal is likely to remain below the AAAQO.

7.6.2 Vegetation Species at Risk

Two SARA Schedule 1 vegetation species at risk and their critical habitats defined in federal Recovery Plans exist in proximity to the Line 3 Replacement Pipeline route. The inclusion on SARA Schedule 1 reflects their status as having crossed a threshold requiring special actions for their protection and recovery. Any additional residual effects have the potential to further contribute to this situation.

Views of Enbridge

Enbridge identified small-flowered sand-verbena (SARA Schedule 1 – Endangered) and smooth arid goosefoot (SARA Schedule 1 – Threatened) as occurring in the vicinity of the Line 3 Replacement Pipeline on the east side of the South Saskatchewan River. Enbridge noted that critical habitat for both species is defined as the area encompassing the occurrence and all natural landforms, soil and vegetation features within a 300 m distance of the occurrence.

Enbridge stated that the Recovery Strategy for small-flowered sand-verbena states that the threats with the greatest level of concern to the species are alteration to or suppression of natural grazing and/or fire regimes, cultivation, the introduction of invasive species, and oil and gas activities. Enbridge also stated that activities likely to result in the destruction of critical habitat for this species include compression, covering, inversion, excavation or extraction of soil, alteration to hydrological regimes, indiscriminate application of fertilizers or pesticides, spreading of wastes and introduction of invasive species.

For smooth arid goosefoot, Enbridge stated that the Recovery Strategy ranks the following processes as a high or medium level of concern to the species: alteration to, or suppression of natural grazing and/or fire regimes, the introduction of invasive species, and oil and gas activities. Activities likely to result in the destruction of critical habitat for smooth arid goosefoot are the same as those for small-flowered sand-verbena, with the addition of deliberate actions to stabilize sand dunes.

Enbridge stated that during consultation with ECCC it was noted that annuals such as small-flowered sand-verbena are most sensitive to disturbances to the seed bank and that the 300 metre critical habitat delineation is in place to address indirect effects such as dust and weeds. Enbridge stated that it is highly unlikely that the seed bank extends past the most eastern observed occurrence due to a lack of sparsely vegetated habitat with an active sand component.

Enbridge stated that both species are located within the area to be avoided by the trenchless crossing of the South Saskatchewan River. The primary drill will be on the west side of the river and water withdrawal will occur from that side as well. The temporary workspace is located on top of the slope of the river crossing in an area considered to be unlikely habitat for either species at risk.

Additional mitigation measures proposed by Enbridge in consultation with ECCC include:

- schedule construction to occur after the seed set period to enhance the survival of the population (for smooth arid goosefoot only);
- fence the drilling workspace;
- mark or flag the plant occurrences;
- limit access between the drill site and the river to foot traffic only;
- avoid taking extra temporary workspace in this area;

- no broadcast application of herbicides within 30 metres. Target spraying, wicking, mowing, or hand-picking are acceptable weed control measures;
- implement the Biosecurity Management Plan to prevent introduction of invasive species; and
- continue consultation with ECCC.

Enbridge indicated that fencing would provide a buffer of about 220 m from the nearest observed small-flowered sand-verbena plant and a buffer of about 210 m from the nearest observed smooth arid goosefoot plant, which is less than the 300 m critical habitat delineation. Enbridge said these buffers were deemed acceptable by ECCC during consultation.

Enbridge concluded that no residual effect would occur to small-flowered sand-verbena or smooth arid goosefoot populations at the South Saskatchewan River crossing as a result of direct interaction during construction, because the workspace will avoid all occurrences of the plants. However, Enbridge noted that residual effects may occur as a result of indirect effects of construction, specifically due to changes in hydrology and invasion by weed species. Enbridge characterized these indirect effects as having a high probability of occurring.

Enbridge said that a rare plant specialist would monitor the effectiveness of implemented mitigation measures for vegetation species at risk at this site as part of its post-construction monitoring program. Affected rare plant populations will be revisited in years 1, 3 and 5 following construction. If issues related to the Project are identified, and if after the five years of post-construction monitoring program these issues remain unresolved, site-specific measures may be developed, which could include additional monitoring or corrective measures. Enbridge committed to continuing to consult with ECCC as warranted, including during post-construction monitoring program, and to notifying the Board of any additional recommendations from ECCC and whether they have or will be implemented.

In response to a Board IR concerning whether there were additional site-specific mitigation measures that could be implemented to increase the likelihood that indirect effects of construction would not occur, and that the mitigation proposed to address direct effects of construction would be successful, Enbridge committed to the following:

- a vegetation resource specialist will complete a pre-construction survey prior to any clearing activity to provide an update on the extent of the SARA plant occurrences and the buffer distance between the nearest observed plant of each species and the protective fencing;
- signage will be placed at select locations along the fence to remind contractors and employees of the foot access restriction;
- the sod layer will be salvaged with topsoil where soil salvage activities occur, and will subsequently be replaced in association with topsoil replacement activities following construction;

- use site-specific dust control measures (for example, watering down of work area, application of dust control, use of a tackifier, limiting vehicle speeds) if dust becomes an issue during construction;
- in the unlikely event of a terrestrial drilling mud release on the east bank of the South Saskatchewan River, the plant occurrences would have been marked, which will alert response crews to continue to avoid the occurrences to the extent feasible during the immediate clean-up;
- if release occurs in proximity to a rare plant occurrence, sandbags or berms could be installed;
- non-invasive and low-impact cleaning methods (for example, hand tools) will be used in the vicinity of the rare plants, to the extent practical;
- in the unlikely event of a drilling mud release within the South Saskatchewan River, access from the west bank would be considered to conduct containment, cleanup and disposal of drilling mud; and
- the installation of a berm at the HDD exit point may be considered, to reduce the potential of a release of drilling mud at the exit point from traveling downslope.

Views of Participants

ECCC acknowledged that Enbridge has extended the length of the horizontal direction drill of the South Saskatchewan River to avoid both SARA-listed plant species. ECCC noted that based on the closest disturbance (temporary workspace) that approaches an individual plant, it finds the mitigation proposed by Enbridge appropriate in this instance.

Views of the Board

The Board is of the view that existing cumulative effects to small-flowered sand-verbena and smooth arid goosefoot as a result of past projects and activities are of high magnitude. Their SARA Schedule 1 status and the fact that critical habitat has been defined for both species under their respective federal Recovery Strategies indicates that an environmental and regulatory threshold has already been crossed.

For the Line 3 Replacement Pipeline, the Board is satisfied that direct effects to small-flowered sand-verbena and smooth arid goosefoot will be avoided at the South Saskatchewan River crossing, with the implementation of the measures proposed by Enbridge. The Board acknowledges Enbridge's commitment to applying additional measures during construction at that site to reduce the potential for indirect effects, mainly through dust, changes in hydrology and weed growth. With the site-specific mitigation committed to by Enbridge, and its post-construction monitoring commitments, the Board is of the view that indirect effects are unlikely to occur. The Board, therefore, is of the view that existing cumulative effects on small-flowered sand-verbena and smooth arid goosefoot are not expected to change, as a consequence of the Project.

The Board reminds Enbridge to include in its updated EPPs and alignment sheets filed with the Board, its mitigation measures for these plant species at risk, and to include these species in its post-construction monitoring program.

7.7 Follow-up Program

The CEAA 2012 requires a follow-up program for verifying the accuracy of the EA and determining the effectiveness of mitigation measures. In consideration of the environmental effects that may warrant more in-depth or rigorous and scientific follow-up (above and beyond standard post-construction monitoring), the Board imposes **Section 58 Order Conditions 20** and **28** and **Decommissioning Order Conditions 12** and **21** to be implemented as a follow-up program. Refer to sections 7.6.1 and 7.5.3.4.2 for more detailed information.

7.8 NEB Conclusion and Recommendation to Governor in Council

The NEB has conducted an environmental assessment of the Project and is of the view that overall, with the implementation of Enbridge's environmental protection procedures and mitigation and the NEB's conditions, the Project is not likely to cause significant adverse environmental effects. Therefore, pursuant to the CEAA 2012, the NEB recommends that the Governor in Council decide that the Project is not likely to cause significant adverse environmental effects.

Chapter 8

Infrastructure, Employment and Economy

The Board's expectations for an applicant regarding direct socio-economic impacts caused by the existence of a project are set out in the Board's Filing Manual. Applicants are expected to identify and consider the impacts a project may have on infrastructure, services, employment and the economy. Applicants are also expected to provide mitigation of negative impacts and the consideration of positive benefits of a project.

Potential socio-economic effects that are caused by changes to the environment are included in Chapter 7, Environment and Socio-Economic Matters. Direct socio-economic effects caused by the existence of the Project itself are discussed below.

8.1 Employment and Economy

Views of Enbridge

Enbridge submitted that the Project is anticipated to create jobs, generate employment income and tax revenues, which are estimated at the local, provincial and federal levels.

Enbridge stated that the peak construction workforce for the Line 3 Replacement Pipeline is estimated to be approximately 650 workers per spread (along nine spreads).

The peak construction workforce for the construction of permanent facilities at the existing Enbridge stations and terminals is estimated to be approximately 50 workers per station/terminal, and 250 at the Hardisty Terminal. In addition to these personnel, Enbridge management, inspection, non-destructive examination, survey, safety and environment staff will total approximately 300 people (100 per spread).

The warranty and remedial work will entail approximately 500 workers in total.

Enbridge submitted that decommissioning of the Existing Line 3 Pipeline will require up to approximately 60 to 100 workers.

Enbridge stated there will be no new permanent full-time positions as a result of the construction of the Line 3 Replacement Pipeline. Operations of the Project will be integrated with the existing Enbridge operations.

Enbridge stated that the Project will generate a demand for goods and services, and that there will be direct and indirect business opportunities resulting from the Project. Businesses that may benefit from contracting and subcontracting opportunities, and goods and service provision include restaurants, lodging, cleaners, fuel stations, and trucking, catering and waste service providers.

Enbridge stated that it is committed to providing work opportunities for Aboriginal groups in proximity to the Line 3 Replacement Pipeline route according to its Aboriginal and Native American Policy. Where possible, these groups will be given an opportunity to provide labour for the Project. Enbridge stated that it expects that the contractor(s) selected for the Project will support Enbridge's commitment that Aboriginal groups and businesses be provided a full and fair opportunity to participate in the construction of the Line 3 Replacement Pipeline through contract opportunities.

Enbridge stated that direct spending during the construction phase is estimated to total $4.328 billion. Approximately $40.0 million (1%) of this amount will be spent in British Columbia, $1.520 billion (35%) in Alberta, $2.076 billion (48%) in Saskatchewan, and, $692.0 million (16%) in Manitoba.

Enbridge stated that labour income generated during the construction phase is estimated to total $1.8286 billion. Approximately $19.5 million (1%) will be generated in British Columbia, $921.6 million (50%) in Alberta, $652.3 million (36%) in Saskatchewan and $235.2 million (13%) in Manitoba.

Enbridge submitted that employment generated (measured in full-time equivalents) is estimated to total 24,493 direct and indirect jobs of which approximately 312 will be in British Columbia, approximately 11,183 will be in Alberta, approximately 9,175 will be in Saskatchewan and approximately 3,823 will be in Manitoba.

Federal, provincial and local taxes generated are estimated to total $514.3 million over the construction phase. Approximately $5.7 million (1%) will be generated in British Columbia, $216.5 million (42%) in Alberta, $183.9 million (36%) in Saskatchewan and $108.2 million (21%) in Manitoba.

Enbridge indicated that during its consultation activities, it heard the following concerns in relation to economy and employment:

- an increase in temporary employment opportunities in the regions surrounding the Line 3 Replacement Pipeline will exacerbate already existing labour shortages, especially skilled labour;
- loss of tax revenue for municipalities crossed by the Existing Line 3 Pipeline, if the Line 3 Replacement Pipeline is constructed outside of their boundaries.

Enbridge stated that it is committed to Aboriginal participation in the Project through all service and supply opportunities. Enbridge submitted that it will include Aboriginal businesses, joint ventures and limited partnerships in requests for proposals where Aboriginal businesses have the capability to execute the particular work packages.

Enbridge stated that its community investments focus on cultural enrichment, education, environmental protection, safety initiatives and community well-being and that it is currently engaging with Aboriginal groups in Saskatchewan, Alberta and Manitoba to identify specific community interests and appropriate investment opportunities.

Enbridge advised that it is working with a number of partners to create and execute training programs for Aboriginal candidates in Alberta, Saskatchewan and Manitoba. Enbridge further stated that with its partners, it is focusing on the following areas: labour, skilled trades, equipment operating and inspector training. Candidates who are successful graduates of these programs may have the opportunity to work through general contractors servicing the Project. Enbridge advised it will be working with general contractors to assist in the creation of employment. In Enbridge's view, its training programs will leave a legacy, through its training initiatives that include transferable skills.

Enbridge noted that through the construction of the Alberta Clipper Project, Aboriginal participation through employment ranged from 10% to more than 30% in varying sections of that project. Enbridge stated that it anticipates that it will be able to achieve that level of participation again and looks to maintain that level where possible.

Views of Participants

Canadian Manufacturers & Exporters stated it supports the Project because it provides significant benefits to Canadian manufacturers.

The Municipality of Pembina stated that approximately 8.5 miles of the Line 3 Replacement Pipeline are located within its municipality, and it will help create an economic spin off for all those who are directly affected by the Project, since jobs will be created and maintained.

George Gordon stated that Enbridge has helped it develop a meaningful partnership; therefore, it supports the Project.

Progressive Contractors Association of Canada stated that it supports the Project as it will provide expanded work opportunities for its member companies and their employees across Canada.

The Regina & District Chamber of Commerce stated that the Line 3 Replacement Pipeline could have a significant impact on a number of its 1200 members, most notably on those employed in the skilled trades, as well as the service industry. Given that the largest section of the Line 3 Replacement Pipeline is in southern Saskatchewan, the Chamber submitted the Project will have a positive impact on the local economy, and that construction and maintenance of the Project will create jobs, which likely will include opportunities for Aboriginal peoples.

Saskatchewan Industrial & Mining Suppliers Association (SIMSA) stated that it supports the Project, and that there is significant potential for local industrial suppliers to benefit from contracting and supplying for this Project, including SIMSA member companies, many of which are Aboriginal-owned.

SCO said that it negotiated an economic partnership with Enbridge and that it developed a joint venture company affiliated with an energy company from Alberta. It stated the Project is an opportunity to develop an economic engine for its community, a good business model and a way to become a part of the economy through joint ventures.

The Winnipeg Chamber of Commerce expressed its support for the Project. It stated that Enbridge's commitment to engaging local companies in the Line 3 Replacement Pipeline's Manitoba component offers significant economic benefits to Winnipeg and Manitoba's economies.

Municipality of Lorne, Rural Municipalities of Dufferin #190 and Stanley, MLA for the Constituency of Moosimin also expressed their support for the Project.

Kahkewistahaw and Moosomin stated that they anticipate that the Project represents an opportunity for their members and business entities to participate in supply chain employment and other business opportunities.

MMF expressed interest for its members to participate in the economic benefits and opportunities associated with the construction, operations, and decommissioning of the Project within its traditional territory.

Pine Creek submitted that five employment opportunities are not a reasonable amount considering the number of employment positions available over the term of the Project.

AMC, Canupawakpa, Ermineskin, Siksika Nation and Stoney raised concerns about the training, employment and procurement opportunities for Aboriginal people for the Project.

Ermineskin, Ocean Man, Sweetgrass, and Beaver Lake stated that Enbridge has not provided sufficient information regarding the ability of the Nations to access the potential economic benefits of the Project or its specific plans to address these issues and ensure members of the Nations are afforded reasonable opportunities to gain employment and business contracts.

8.2 Infrastructure and Services

Views of Enbridge

Enbridge stated that housing, commercial accommodation and temporary work camps will be required to house workers during construction.

Enbridge submitted that during the construction phase of the Project, an increased demand on existing emergency, protective, health care and social services may occur due to direct Project activities and indirect demands of the temporary construction workforce.

Enbridge stated that in order to decrease the demand on community infrastructure and service during construction, a potential work camp in the Town of Davidson, Saskatchewan is planned, and a potential worker camp near the Hardisty Terminal may be necessary.

Enbridge submitted that specific roadways expected to be used to access the RoW during construction include Alberta Highway 13, Saskatchewan Highways 317, 31, 21, 4, 7, 15, 45, 44, 2 and 48, Manitoba Highways 83, 2 and 3 and various rural roads in all three provinces.

Enbridge submitted that municipal representatives expressed concern about an increase in traffic, especially industrial traffic and heavy vehicles on highways, rural and local roads, as this would disrupt existing traffic patterns. Enbridge stated that a Traffic Control Strategy will be implemented and speed limits on all roads, accesses and construction RoWs used will be enforced.

Enbridge stated that prior to commencing construction activities, it will notify the Municipal Districts (MD), Rural Municipalities (RM) and communities regarding the locations and timing of construction.

Waste

Enbridge stated that a potential temporary work camp near the Town of Davidson will produce solid (household) and liquid waste that will need to be collected and hauled to appropriate facilities.

Enbridge submitted that several municipalities, including the Town of Davidson and the City of Morden, expressed concern that waste management infrastructure, such as landfills and wastewater treatment systems, may not have sufficient capacities to handle an increase in waste from construction related activities.

Enbridge stated that it will work with municipal officials to identify and implement actions that will help prevent workforce demands from exacerbating any existing concerns in the MDs, RMs, cities, towns or villages where solid waste and wastewater treatment capacity issues have been identified.

Enbridge indicated that in order to reduce these effects, it will ensure that for the potential temporary construction camp at the Town of Davidson, detailed waste management protocols are established in conjunction with local and regional waste authorities.

Enbridge confirmed that all liquid and solid wastes generated as a result of the Project will be disposed of at an appropriate facility and through appropriate disposal methods. All waste disposal methods will comply with required approvals, licenses and applicable regulations.

Enbridge stated that mitigation measures such as notifying the MD, RMs, municipalities and emergency and health care service providers of construction activities and timelines prior to the commencement of construction will help prepare service providers for the influx of workers and risks around construction-related activities. Enbridge will adhere to provincial legislation and safety standards when conducting any construction-related activities.

Views of Participants

George Gordon discussed Enbridge's waste management plan in its evidence and submitted that better outcomes could be achieved by developing an integrated waste management plan for the Project. George Gordon confirmed that this is one of the areas in which it would like to work with Enbridge to develop a waste management policy. George Gordon stated that it has developed the expertise to help Enbridge in the planning of and execution of waste management.

The Saskatchewan Chamber of Commerce stated that the increased pipeline capacity will alleviate the rail capacity constraints to the export of grain, potash and goods.

Views of the Board

The Board is satisfied that Enbridge has identified and considered all relevant socio-economic aspects of the Project, and has proposed suitable mitigation to address the Project's potential socio-economic effects.

The Board recognizes the potential impacts that an influx of construction workers can have on local communities. In this case, the Board is of the view that, should the Project be approved, the measures planned by Enbridge would address the potential impacts of the Project on community infrastructure and service during construction. The Board notes Enbridge's commitment to implementing plans to address the Project's socio-economic impacts, including the Environmental Traffic Control Plan and Waste Management Plan. The Board encourages Enbridge to consult with George Gordon with respect to, among other things, its waste management plan. The Board is of the view that the use of proposed temporary camps for Project construction workers would be effective in addressing Project effects on local infrastructure and services. Accordingly, the Board imposes **Section 58 Order Condition 8** requiring Enbridge to provide an environmental and socio-economic protection plan for the temporary work camps, in the event a camp is required.

The Board notes Enbridge's commitments to providing contracting and procurement opportunities to qualified local and Aboriginal businesses, and its commitments to providing opportunities for the employment of Aboriginal workers. The Board notes the importance of realizing economic benefits to local and Aboriginal communities.

In light of the measures outlined in Enbridge's Application, subsequent filings and the Board's conditions, the Board finds that the Project's impacts on infrastructure and services would be adequately addressed. The Board also finds that the Project would provide benefits to Aboriginal, local, regional and provincial economies and that any adverse socio-economic impacts of the Project would be adequately addressed through Enbridge's proposed mitigation.

Appendix I - List of Issues

The Board identified but did not limit itself to considering the following issues in this hearing:

1. The need for the Project
2. The economic feasibility of the Project.
3. The potential commercial impacts of the Project.
4. The potential environmental and socio-economic effects of the Project, including those to be considered under the *Canadian Environmental Assessment Act, 2012*.
5. The appropriateness of the general route and land requirements for the Project.
6. The suitability of the design of the Project.
7. Potential impacts of the Project on Aboriginal interests.
8. Potential impacts of the Project on landowners and land use.
9. Contingency planning for product release, accidents or malfunctions, during construction and operation of the Project.
10. The suitability of the decommissioning plan for the existing Line 3 pipeline, including whether the decommissioning is appropriately an interim step to eventual abandonment or whether it is the final step in the pipeline's lifecycle.
11. Safety and security during construction and operation of the Project, including emergency response planning and third-party damage prevention.
12. The terms and conditions to be included in any recommendation or approval the Board may issue.

Appendix II - Aboriginal Groups that Participated in the OH-02-2015 Proceeding and the Form of their Participation

Aboriginal Group	Intervenor	Commenter	Presented Oral Traditional Evidence	Filed Written Evidence	Provided Final Argument
Asini Wachi Nehiyawak Traditional Band	•			•	
Assembly of Manitoba Chiefs	•		•	•	•
Beaver Lake Cree Nation	•			•	
Canupawakpa Dakota Nation	•			•	
Central Urban Métis Federation Inc.	•				
Dakota Plains Wahpeton Oyate	•				
Dakota Tipi First Nation	•				
Eastern Region III, Métis Nation - Saskatchewan	•				
Ermineskin Cree Nation #138	•			•	
File Hills Qu'Appelle Tribal Council	•		•		
Frog Lake First Nation	•				
George Gordon First Nation	•		•	•	•
Kahkewistahaw First Nation	•			•	
Keeseekoose First Nation	•		•	•	•
The Manitoba Métis Federation	•		•	•	•
Michel First Nation	•		•	•	•
Montana First Nation	•				
Moosomin First Nation	•		•	•	
Mosquito Grizzly Bear's Head Lean	•				•

Man First Nation					
Ocean Man First Nation #408 (withdrew from hearing)	•			•	
Ochapowace Nation	•		•	•	•
Onion Lake Cree Nation		•			
Pasqua First Nation	•		•	•	•
Peguis First Nation	•		•	•	•
Piapot First Nation		•			
Piikani First Nation	•		•	•	
Pine Creek First Nation	•			•	
Poundmaker First Nation #114	•				
Roseau River Anishinabe First Nation	•		•	•	
Samson Cree Nation	•		•	•	•
Siksika Nation #430	•			•	
Southern Chiefs' Organization	•		•	•	
Stoney Tribal Administration	•			•	•
Sweetgrass First Nation	•			•	
Thunderchild First Nation	•				
Treaty 2 Territorial Alliance	•			•	
White Bear First Nation	•			•	•

Appendix III - Section 52 Certificate Conditions

In these conditions, the terms and expressions below (in bold) have the following meaning:

Application Enbridge's application dated 5 November 2014, pursuant to sections 52 and 58 of the *National Energy Board Act* (NEB Act) and section 45.1 of the *National Energy Board Onshore Pipeline Regulations* (OPR).

Certificate – Certificate of Public Convenience and Necessity authorizing the construction and operation of the Section 52 Pipeline and related Facilities, pursuant to section 54 of the NEB Act.

commencing construction - the clearing of vegetation, ground-breaking and other forms of right-of-way (RoW) preparation that may have an impact on the environment (activities associated with normal surveying do not constitute commencing construction).

Enbridge – Enbridge Pipelines Inc.

for approval - When a condition requires a filing for NEB approval, Enbridge must not commence the indicated activity until the Board issues its written approval of that filing.

including – Use of this term, or any variant of it, is not intended to limit the elements to just those listed. Rather, it implies minimum requirements with the potential for augmentation, as appropriate.

NEB or Board – National Energy Board

Project – The Line 3 Replacement Program, and all of its applied-for components.

Section 52 Pipeline and related Facilities – The proposed pipeline and related facilities, forming part of the Project, for which Enbridge requests a Certificate pursuant to section 52 of the NEB Act. Specifically, the Section 52 Pipeline and related Facilities are two new 914 mm (NPS 36) replacement pipeline segments with a total Pipeline length of approximately 1,096 km. The proposed pipeline would transport heavy, medium and light crude oil at a maximum operating pressure (MOP) of 9,930 kPa.

Certificate Conditions

General

1. Condition Compliance

Enbridge shall comply with all of the conditions contained in this Certificate, unless the Board otherwise directs.

2. Section 52 Pipeline and Related Facilities Design, Location, Construction, and Operation

Enbridge shall cause the Section 52 Pipeline and related Facilities to be designed, located, constructed, installed and operated in accordance with the specifications, standards, commitments made and other information included in or referred to in its Application or in its related submissions.

3. Environmental Protection

Enbridge shall implement or cause to be implemented all of the policies, practices, programs, mitigation measures, recommendations, procedures and its commitments for the protection of the environment included in or referred to in its Application or in its related submissions.

4. Certificate Expiration (Sunset Clause)

Unless the Board otherwise directs prior to [three years from the date of the Certificate] this Certificate shall expire on [three years from the date of the Certificate] unless construction in respect of the Section 52 Pipeline and related Facilities has commenced by that date.

Prior to and During Construction

5. Security Management

Enbridge shall file with the Board, in accordance with the timelines below, confirmation, signed by an officer of the company:

a) **at least 90 days prior to commencing construction**, that it has developed a Security Management Plan for construction of the Section 52 Pipeline and related Facilities; and
b) **at least 90 days prior to commencing operations**, that it has amended its corporate Security Management Program to include operation of the Section 52 Pipeline and related Facilities, pursuant to the OPR and CSA Z246.1 (as amended from time to time).

Each filing shall include a statement confirming that the signatory to the filing is an officer of Enbridge.

6. *Pipeline Environmental Protection Plan*

Enbridge shall file with the Board for approval, **at least 90 days prior to commencing construction**, an updated Pipeline Environmental Protection Plan (Pipeline EPP) specific to the Section 52 Pipeline and related Facilities. The Pipeline EPP shall describe all environmental protection commitments, procedures, and mitigation and monitoring commitments, as set out in the Application, Enbridge's subsequent filings, or as otherwise agreed to in Enbridge's related submissions.

The Pipeline EPP shall include the following:

a) environmental procedures, criteria for implementing these procedures, mitigation measures, and monitoring applicable to all phases and activities of the Section 52 Pipeline and related Facilities;
b) any updates to contingency plans and management plans;
c) updated environmental alignment sheets; and
d) a reclamation plan for each of the different land use types traversed (for example, wetland, hayland, native prairie, cultivated, riparian), including a description of the condition to which Enbridge intends to reclaim and maintain the right-of-way once construction has been completed, and a description of measurable goals for reclamation.

7. *Strain Based Design*

Enbridge shall file with the Board, **at least 90 days prior to commencing construction**, the following information related to strain based design for the Section 52 Pipeline and related Facilities:

a) A summary of the analysis completed to determine if strain based design is required; and
b) If strain based design is determined to be required at some locations,
    i. the location(s) and rationale for selecting strain based design at each of those locations;
    ii. a report summarizing the adequacy of the strain based design for various loading scenarios during construction and operation for each location provided in i); and
    iii. a list of standards and specifications, including testing procedures, that are used in the strain based design.

8. *Finalized Watercourse Crossing Inventory and Design*

Enbridge shall file with the Board, **at least 90 days prior to commencing construction of any watercourse crossings,** the following:

a) An updated inventory of all watercourses to be crossed, including, for each crossing:
    i. the name of the watercourse being crossed and an identifier for the crossing;
    ii. the location of the crossing;

iii. the primary and contingency crossing methods;
iv. planned construction timing;
v. information on the presence of fish and fish habitat;
vi. the fisheries timing window of least risk; and
vii. an indication of whether any of Fisheries and Oceans Canada's applicable "*Measures to Avoid Causing Harm to Fish and Fish Habitat* will not be implemented.

b) Detailed generic design drawings of trenchless, dry open-cut, frozen open-cut and isolation crossings of various watercourse types.

c) For each watercourse crossing where any of Fisheries and Oceans Canada's applicable *Measures to Avoid Causing Harm to Fish and Fish Habitat* will not be implemented, for the primary watercourse construction methods, provide:
   i. detailed crossing-specific design drawings;
   ii. photographs of the crossing location, as well as upstream and downstream;
   iii. a description of the fish species and habitat that is present at the crossing location, and if fish spawning is likely to occur within the immediate area;
   iv. the site-specific mitigation and habitat enhancement measures to be used to minimize impacts;
   v. any potential residual effects;
   vi. proposed reclamation measures; and
   vii. a discussion of the potential impacts to local fisheries resources within the immediate area as a result of the crossing construction.

9. Construction Emergency Preparedness and Response Planning

Enbridge shall file with the Board, **at least 60 days prior to commencing construction**, the Emergency Response Plan, specific to the Section 52 Pipeline and related Facilities, that will be implemented during the construction phase of the Section 52 Pipeline and related Facilities. The plan shall include spill contingency measures that Enbridge will employ in response to accidental spills attributable to construction activities, 24-hour medical evacuation, fire response, and security.

10. Outstanding Traditional Land Use Investigations

Enbridge shall file with the Board for approval and serve a copy on all participating Aboriginal groups, **at least 60 days prior to commencing construction**, a plan to address outstanding Traditional Land Use (TLU) investigations for the Section 52 Pipeline and related Facilities. The plan shall include:

a) a summary of the status of TLU investigations undertaken for the Section 52 Pipeline and related Facilities, including Aboriginal group-specific TLU studies and any supplementary pre-construction field investigation or reconnaissance activities relevant to potentially affected Aboriginal groups;

b) a summary of the effects of the Section 52 Pipeline and related Facilities on the current use of lands and resources for traditional purposes identified in the investigations;
c) a summary of the mitigation measures proposed by Enbridge and/or by affected Aboriginal groups to address the effects of the Section 52 Pipeline and related Facilities identified in the investigations;
d) a description of how Enbridge has incorporated any additional mitigation measures into its Pipeline EPP;
e) a description of any outstanding concerns raised by potentially affected Aboriginal groups regarding potential effects of the Section 52 Pipeline and related Facilities on the current use of lands and resources for traditional purposes, including a description of how these concerns have been or will be addressed by Enbridge; and
f) a summary of any outstanding TLU investigations or follow-up activities that will not be completed prior to commencing construction, including an explanation as to why these will not be completed prior to commencing construction, and an estimated completion date, if applicable.

11. Aboriginal Consultation Reports

Enbridge shall file with the Board, **at least 30 days prior to commencing construction**, and at the end of every second month thereafter until completing construction, a report summarizing Enbridge's consultations with all potentially affected Aboriginal groups identified. These reports shall include:

a) a summary of the concerns raised by Aboriginal groups;
b) a description of how Enbridge has addressed or will address the concerns raised;
c) a description of any outstanding concerns; and
d) a description of how Enbridge intends to address any outstanding concerns, or an explanation as to why no further steps will be taken.

12. Aboriginal Monitoring Plan

Enbridge shall file with the Board, and serve a copy on those Aboriginal groups identified in a), **at least 30 days prior to commencing construction**, a plan describing participation by Aboriginal groups in monitoring during construction. The plan shall include:

a) a list of the Aboriginal groups consulted concerning participation in monitoring during construction;
b) a list of those Aboriginal groups, if any, who have reached agreement with Enbridge to participate as monitors during construction;
c) a description of the scope, methodology, and measures for monitoring activities to be undertaken by each participating Aboriginal group identified in b), including:
    i. a summary of consultations undertaken with participating Aboriginal groups to determine the proposed scope, methodology, and measures for monitoring;
    ii. those elements of construction and geographic locations that will involve Aboriginal monitoring;

iii. a description of how information gathered through the participation of Aboriginal monitors will be used by Enbridge; and
iv. a description of how information gathered through the participation of Aboriginal monitors will be provided to participating Aboriginal groups; and

d) for those Aboriginal groups who have not reached agreement with Enbridge to participate as monitors during construction, an explanation as to why.

13. Programs and Manuals - Safety

Enbridge shall file with the Board, **at least 30 days prior to commencing construction**, Construction Safety Manuals (project-specific Safety Plans) for the Section 52 Pipeline and related Facilities.

14. Commitments Tracking Table

Enbridge shall:

a) file with the Board and post on its Project website, **within 90 days from the date of this Certificate and at least 30 days prior to commencing construction**, a Commitments Tracking Table (CTT) listing all commitments made by Enbridge in its Application or in its related submissions applicable to the Section 52 Pipeline and related Facilities, including reference to:
   i. the documentation in which the commitment appears (for example, the Application, responses to information requests, hearing transcripts, permit requirements, condition filings, or other);
   ii. the accountable lead for implementing each commitment; and
   iii. the estimated timelines associated with the fulfillment of each commitment;

b) update the status of the commitments in a) on its Project website and file these updates with the Board on:
   i. a monthly basis until commencing operations; and
   ii. a quarterly basis until the end of the fifth year following the commencement of operations; and

c) maintain at its construction office(s):
   i. the CTT listing all regulatory commitments and their completion status, including those commitments resulting from Enbridge's Application and subsequent filings and conditions from permits, authorizations and approvals;
   ii. copies of any permits, approvals or authorizations issued by federal, provincial or other permitting authorities, which include environmental conditions or site-specific mitigation or monitoring measures; and
   iii. any subsequent variances to permits, approvals or authorizations referred to in c) ii).

15. Watercourse Trenchless Crossings

Enbridge shall file with the Board, **at least 30 days prior to commencing watercourse trenchless crossings**, Enbridge's watercourse trenchless crossings execution plan.

16. Depth of Cover at Water Crossings

At water crossings, where the potential depth of scour exceeds 1.2 m, Enbridge shall bury the pipeline at a sufficient depth to prevent pipeline exposure during a 100-year flood event.

Enbridge shall file with the Board, **at least 15 days prior to commencing crossing work**, written notification including the following:

a) the location of the crossing;
b) the depth of cover to which the pipeline will be buried at the crossing; and
c) a description of any additional measure, other than depth of cover, that will be implemented at the crossing to minimize the scour depth and/or the pipeline exposure.

17. Contingency Watercourse Crossing Method

a) For any watercourse crossing where Enbridge will employ a contingency crossing method instead of its proposed primary method, and where all of Fisheries and Oceans Canada's applicable *Measures to Avoid Causing Harm to Fish and Fish Habitat* will be implemented, Enbridge shall file with the Board a notification to this effect, **at least 15 days prior to commencing the contingency crossing**. In the notification, Enbridge shall explain why the contingency method is being employed and provide a summary of the differences between the primary and contingency watercourse crossing methods.
b) For any watercourse crossing where Enbridge will employ a contingency crossing method instead of its proposed primary method, and where any of Fisheries and Oceans Canada's applicable *Measures to Avoid Causing Harm to Fish and Fish Habitat* will not be implemented, Enbridge shall file with the Board **at least 30 days prior to commencing construction of the contingency watercourse crossing**:
    i. confirmation of the contingency watercourse crossing method that will be employed, the rationale for employing that method, and a summary of the differences between the primary and contingency watercourse crossing methods; and
    ii. the following site-specific information:
        a. detailed crossing-specific design drawings;
        b. photographs of the crossing location, as well as upstream and downstream;
        c. a description of the fish species and habitat that is present at the crossing location, and if fish spawning is likely to occur within the immediate area;

d. the site-specific mitigation and habitat enhancement measures to be used to minimize impacts;
e. any potential residual effects;
f. proposed reclamation measures; and
g. a discussion of the potential impacts to local fisheries resources within the immediate area as a result of the crossing's construction.

18. Heritage Resources

Enbridge shall file with the Board, **at least 14 days prior to commencing construction,** confirmation, signed by an officer of the company, that:

a) it has obtained or will obtain all of the required archaeological and heritage resource permits and clearances from Alberta Culture and Tourism; Saskatchewan Parks, Culture and Sport; and Manitoba Culture, Heritage and Tourism;
b) it will meet any conditions and respond to any comments and recommendations contained in the permits and clearances referred to in a); and
c) it has incorporated or will incorporate any additional mitigation measures into its Pipeline EPP as a result of any conditions or recommendations contained in the permits or clearances referred to in a.

19. Construction Schedule

Enbridge shall file with the Board, **at least 14 days prior to commencing construction**, a detailed construction schedule(s) identifying major construction activities, and shall notify the Board in writing of any modifications to the schedule(s) as they occur.

20. Slope and Bank Failures

Enbridge shall file with the Board, **at least 14 days prior to commencing geo-technical work**, a report that includes a detailed description and scope of the mitigation necessary to protect the Section 52 Pipeline and related Facilities and right-of-way, from future bank or slope failures.

21. Field Joining Program

Enbridge shall file with the Board, **at least 14 days prior to commencing joining activity**, the Field Joining Program

22. Pressure Testing Program

Enbridge shall file with the Board, **at least 14 days prior to commencing pressure testing**, the Pressure Testing Program that demonstrates compliance with applicable codes, standards, and regulatory requirements.

23. Authorizations under paragraph 35(2)(b) of the Fisheries Act

For those watercourse crossings that will require Authorization under paragraph 35(2)(b) of the *Fisheries Act*, Enbridge shall file with the Board, **at least 10 days prior to commencing construction of each of the watercourse crossings**, a copy of the Authorization under paragraph 35(2)(b) of the *Fisheries Act*.

24. Welding and Non-Destructive Examination Procedures

Enbridge shall, during welding activities, maintain at each construction site:

a) a copy of the applicable welding procedures;
b) a copy of the applicable non-destructive examination (NDE) and testing procedures used on the Section 52 Pipeline and related Facilities;
c) all supporting documentation related to NDE and testing.

Enbridge shall include, in the applicable NDE and testing procedures referred to in b) and c) above, a requirement to delay NDE of final tie-in welds and any repairs to them for 48 hours following completion of welding.

25. Breeding Bird Survey

In the event of clearing, construction or reclamation activities for the Section 52 Pipeline and related Facilities within restricted activity periods for non-migratory birds protected under provincial jurisdiction and for migratory birds, Enbridge shall retain a qualified avian biologist to carry out a survey prior to these activities, in accordance with current Environment and Climate Change Canada guidance, to identify any birds and active nests in areas immediately surrounding the site. Enbridge shall file the results with the Board **every 15 days when surveys are active during the breeding bird restricted activity period**. The results shall include:

a) documentation or information to confirm that the appropriate provincial and federal government authorities were consulted prior to the activity, on the proposed methodology for the survey, the mitigation and monitoring to be used, and a description of any outstanding concerns they may have; and
b) if active nests were found:
    i. mitigation that was or will be implemented, including monitoring, which was developed in consultation with Environment and Climate Change Canada and the appropriate provincial government authorities, to protect any identified migratory and non-migratory birds and their nests; and
    ii. mitigation that was or will be implemented including monitoring, developed in consultation with Environment and Climate Change Canada to protect any birds listed under the *Species at Risk Act*, and their nests.

26. Protection of the Environment – Pressure Testing

Enbridge shall file with the Board, **at least 60 days prior to commencing pressure testing of the Section 52 Pipeline and related Facilities**, a plan for the protection of the environment as a result of pressure testing activities. The plan shall include:

a) aerial photographs or environmental alignment sheets showing the locations of all water withdrawal and discharge sites and any temporary workspace requirements to access those sites;
b) a discussion of any clearing requirements and temporary access road construction activities that are required, to allow for the transportation of the hydrostatic test water;
c) water withdrawal rates and volume to be withdrawn at each site;
d) the site-specific environmental protection measures to be implemented at the water withdrawal and discharge sites and at temporary access sites;
e) the circumstances under which hydrostatic test water would be reused; and
f) whether any chemical additives would be used.

27. Construction Progress Reports

Enbridge shall file with the Board, **by the 15th day and the end of each month during construction**, construction progress reports. The reports shall include information on the activities carried out during the reporting period; any environmental, socio-economic, safety and security issues and issues of non-compliance; and the measures undertaken for the resolution of each issue and non-compliance.

Post-Construction and Operations

28. Geotechnical Report on Slope Stability

Enbridge shall file with the Board, **within 90 days after the completion of construction**, a geotechnical report on slope stability that includes:
a) the geotechnical observations;
b) the field recommendations;
c) how Enbridge implemented the field recommendations during construction of the Section 52 Pipeline and related Facilities;
d) the location of trench breakers, drainage and erosion control measures;
e) all of the slope stabilization techniques implemented;
f) its recommendations with respect to follow-up monitoring;
g) a plan to follow up on the recommendations made in f); and
h) a rationale for circumstances where field or other recommendations have not been implemented.

29. Operational Consultation Plan for Aboriginal Groups

Enbridge shall file with the Board for approval, and serve a copy on all potentially affected Aboriginal groups, **at least 60 days prior to commencing operations**, a plan for consultation with Aboriginal groups during the operational phase of the Section 52 Pipeline and related Facilities. The plan shall include:
a) a summary of how Aboriginal groups were consulted on the development of the plan, including:
    i. a list of the Aboriginal groups consulted;

ii. a description of the design of and activities undertaken during the consultation;
iii. a summary of the results of the consultation in terms of input received from Aboriginal groups; and
iv. a description of how input received from Aboriginal groups has informed the design of the plan;

b) a discussion of how implementation of the plan will be coordinated with regulatory requirements that may involve consultation with Aboriginal groups, such as the communication of information relating to safety, security and protection of the environment pursuant to paragraph 6.5(1)(m) of the *National Energy Board Onshore Pipeline Regulations*;

c) a description of:
i. the consultation methods and tools to be used to implement the plan;
ii. how information gathered through the implementation of the plan will be used by Enbridge; and
iii. how information gathered through the implementation of the plan will be provided to participating Aboriginal groups; and

d) a description of how the plan will be regularly evaluated and adapted as appropriate.

30. Operational Consultation Plan for Landowners

Enbridge shall file with the Board for approval, and provide notice to all landowners and a copy upon request, **at least 60 days prior to commencing operations**, a plan for consultation with landowners during the operational phase of the Section 52 Pipeline and related Facilities. The plan shall include:

a) a summary of how landowners were consulted on the development of the plan, including:
i. a description of the design of and activities undertaken during the consultation;
ii. a summary of the results of the consultation in terms of input received from landowners; and
iii. a description of how input received from landowners has informed the design of the plan;

b) a discussion of how implementation of the plan will be coordinated with regulatory requirements that may involve consultation with landowners, such as the communication of information relating to safety, security and protection of the environment pursuant to paragraph 6.5(1)(m) of the *National Energy Board Onshore Pipeline Regulations*;

c) a description of:
i. the consultation methods and tools to be used to implement the plan;
ii. how information gathered through the implementation of the plan will be used by Enbridge; and
iii. how information gathered through the implementation of the plan will be provided to participating landowners; and

d) a description of how the plan will be regularly evaluated and adapted as appropriate.

31. Operation and Maintenance Manual

Enbridge shall file with the Board, **at least 14 days prior to commencing operations**, its Operation and Maintenance Manual.

32. Condition Compliance by the Accountable Officer

Within 30 days after commencing operations, Enbridge shall file with the Board a written confirmation, by its accountable officer, as defined in the *National Energy Board Onshore Pipeline Regulations*, that the Section 52 Pipeline and related Facilities were completed and constructed in compliance with all applicable conditions in this Certificate. If compliance with any of these conditions cannot be confirmed, the accountable officer shall file with the Board details as to why compliance cannot be confirmed. The filing required by this condition shall include a statement confirming that the signatory to the filing is Enbridge's accountable officer.

33. Landowners Issues Resolution Tracking

Enbridge shall file with the Board, **within 30 days after commencing operations**, a written confirmation that it created and will maintain records to chronologically track landowner issues resolution related to the Section 52 Pipeline and related Facilities. The landowner issues resolution records shall include:

a) the date the issue was raised with Enbridge;
b) how the issue was raised with Enbridge (that is, telephone, mail, email);
c) subsequent dates of all telephone calls, correspondence, site monitoring/inspections, follow-up reports and other documentation related to the issue and issue resolution;
d) updated contact information for all persons involved in the issue resolution;
e) the date the issue was resolved; and
f) if the issue was not resolved, any further actions to be taken or a rationale for not taking further action.

34. Pipeline Geographic Information System (GIS) Data

Enbridge shall file with the Board, **within one year after commencing operations**, GIS data in the form of an Esri® shape file that contains pipeline segment centre lines, where each segment has a unique outside diameter, wall thickness, maximum operating pressure (MOP), external coating, field-applied girth weld coating, and pipe manufacturing specification. If the above values of the pipeline change at any point along the length of the pipeline, the pipeline should be segmented at that point.The datum shall be NAD83 and projection shall be geographic (latitudes and longitudes).

35. Emergency Response Exercise

Within 18 months after commencing operations, Enbridge shall:

a) conduct one full-scale and two table-top emergency response exercises. Of the three exercises, one shall be conducted in every province in which the Section 52 Pipeline and related Facilities operate (those are, Alberta, Saskatchewan, and Manitoba). The objective of the emergency response exercises shall be to test the effectiveness and adequacy of the:
   i. Emergency Procedures Manual;
   ii. training of company personnel;
   iii. communications systems;
   iv. coordination of emergency response activities with responders, mutual aid partners and other agencies;
   v. response equipment;
   vi. safety procedures; and
   vii. exercise debrief process;

b) Provide the Board in writing, **at least 45 days prior to the date of each emergency response exercise referred to in a)**, the following:
   i. location of the exercise;
   ii. exercise coordinator;
   iii. date of the exercise;
   iv. duration of the exercise;
   v. confirmation that a representative from each province (that is, Alberta, Saskatchewan and Manitoba) has been invited to participate in or observe the exercise;
   vi. the name and organization of each individual, including representatives from Aboriginal groups, invited to participate in the exercise,
   vii. type of exercise (that is, tabletop, or full scale); and
   viii. goals (for example, focus of exercise, scope, scale, extent of play, format, evaluation method), and how success is measured;

c) file with the Board, **within 90 days of completion of each emergency response exercise referred to in a)**, a report that documents the results of the exercise including:
   i. how the exercise achieved the stated objectives;
   ii. participant feedback and areas for improvement; and
   iii. a corrective action plan to address the findings from the exercise.

36. Post-Construction Environmental Monitoring Reports

Enbridge shall file with the Board, **on or before 31 January following each of the first, third and fifth complete growing seasons after completing final clean-up**, a post-construction environmental monitoring report that:

a) describes the methodology used for monitoring;
b) identifies any modifications from the criteria established for evaluating reclamation success described in its Pipeline EPP, as approved by the Board, and the rationale for any modifications;

c) identifies the issues to be monitored, including unexpected issues that arose during construction, and their locations (for example, on a map, diagram or table);
d) describes the current status of the issues (resolved or unresolved), any deviations from plans, and corrective actions undertaken;
e) assesses the effectiveness of mitigation measures (planned and corrective) against the criteria for success;
f) includes a summary of Enbridge's consultation with appropriate government authorities, and any potentially affected Aboriginal groups and stakeholders, including any issues or concerns raised and how Enbridge has addressed or responded to them; and
g) provides proposed measures and the schedule that Enbridge will implement to address any ongoing issues or concerns.

37. Operational Consultation Report

Enbridge shall file with the Board, **five years after commencing operations**, an operational consultation report. The report shall be filed with the Board on or before 31 December of the reporting year and shall include:

a) a summary of the outcomes of the operational consultation plans for Aboriginal groups and landowners (**Conditions 29** and **30**), including activities undertaken and lessons learned;
b) an assessment of the overall effectiveness of the operational consultation plans for Aboriginal groups and landowners; and
c) a summary of any changes or improvements that have been made to the operational consultation plans for Aboriginal groups and landowners.

Appendix IV - Section 58 Order Conditions

In these conditions, the terms and expressions below (in bold) have the following meaning:

Application – Enbridge's application dated 5 November 2014, pursuant to sections 52 and 58 of the *National Energy Board Act* (NEB Act) and section 45.1 of the *National Energy Board Onshore Pipeline Regulations* (OPR).

commencing construction - the clearing of vegetation, ground-breaking and other forms of preparation of the facility sites that may have an impact on the environment (activities associated with normal surveying do not constitute commencing construction).

Enbridge – Enbridge Pipelines Inc.

for approval - When a condition requires a filing for NEB approval, Enbridge must not commence the indicated activity until the Board issues its written approval of that filing.

including – Use of this term, or any variant of it, is not intended to limit the elements to just those listed. Rather, it implies minimum requirements with the potential for augmentation, as appropriate.

NEB or Board – National Energy Board

Order – Board Order authorizing the construction and operation of the Section 58 Facilities pursuant to section 58 of the NEB Act

Project – The Line 3 Replacement Program, and all of its applied-for components.

Section 58 Facilities – The proposed facilities, forming part of the Project, for which Enbridge requests an Order pursuant to section 58 of the NEB Act. The Section 58 Facilities include 18 new pump stations, nine sending and receiving trap facilities, and expansion work at the Hardisty Terminal in Alberta encompassing three new storage tanks (50,000m^3) with associated facilities.

Section 58 Order Conditions

General

1. Condition Compliance

Enbridge shall comply with all of the conditions contained in this Order, unless the Board otherwise directs.

2. Section 58 Facilities Design, Location, Construction, and Operation

Enbridge shall cause the Section 58 Facilities to be designed, located, constructed, installed and operated in accordance with the specifications, standards, commitments made and other information included in or referred to in its Application or in its related submissions.

3. Environmental Protection

Enbridge shall implement or cause to be implemented all of the policies, practices, programs, mitigation measures, recommendations, procedures and its commitments for the protection of the environment included in or referred to in its Application or in its related submissions.

4. Order Expiration (Sunset Clause)

Unless the Board otherwise directs prior to [one year from the date of the Order], this Order shall expire on [one year from the date of the Order] unless construction in respect of the Section 58 Facilities has commenced by that date.

Prior to and During Construction

5. Security Management

Enbridge shall file with the Board, in accordance with the timelines below, written confirmation, signed by an officer of the company:

a) **at least 60 days prior to commencing construction**, that it has developed a Security Management Plan for construction of the Section 58 Facilities; and
b) **at least 90 days prior to commencing operations**, that it has amended its corporate Security Management Program to include operation of the Section 58 Facilities; pursuant to the OPR and CSA Z246.1 (as amended from time to time).

Each filing must include a statement confirming that the signatory to the filing is an officer of Enbridge.

6. Facilities Environmental Protection Plan

Enbridge shall file with the Board for approval, **at least 60 days prior to commencing construction**, an updated Facilities Environmental Protection Plan (Facilities EPP) specific to the Section 58 Facilities. The Facilities EPP shall describe all environmental protection commitments, procedures, and mitigation and monitoring commitments, as set out in the Application, Enbridge's subsequent filings, or as otherwise agreed to in Enbridge's related submissions.

The Facilities EPP shall include the following:

a) environmental procedures, criteria for implementing these procedures, mitigation measures, and monitoring applicable to all phases and activities of the Section 58 Facilities;
b) any updates to contingency plans and management plans; and
c) updated alignment sheets and/or plot plans.

7. Outstanding Traditional Land Use Investigations

Enbridge shall file with the Board for approval and serve a copy on all participating Aboriginal groups, **at least 60 days prior to commencing construction**, a plan to address outstanding Traditional Land Use (TLU) investigations for the Section 58 Facilities. The plan shall include:

a) a summary of the status of TLU investigations undertaken for the Section 58 Facilities, including Aboriginal group-specific TLU studies and any supplementary pre-construction field investigation or reconnaissance activities relevant to potentially affected Aboriginal groups;
b) a summary of the effects of the Section 58 Facilities on the current use of lands and resources for traditional purposes identified in the investigations;
c) a summary of the mitigation measures proposed by Enbridge and/or by affected Aboriginal groups to address the effects of the Section 58 Facilities identified in the investigations;
d) a description of how Enbridge has incorporated any additional mitigation measures into its Facilities EPP;
e) a description of any outstanding concerns raised by potentially affected Aboriginal groups regarding potential effects of the Section 58 Facilities on the current use of lands and resources for traditional purposes, including a description of how these concerns have been or will be addressed by Enbridge; and
f) a summary of any outstanding TLU investigations or follow-up activities that will not be completed prior to commencing construction, including an explanation as to why these will not be completed prior to commencing construction, and an estimated completion date, if applicable.

8. Temporary Work Camps

Enbridge shall notify the Board, **at least 45 days prior to commencing construction of the temporary work camp**, as to whether a temporary work camp(s) (Camp) is required.

In the event that Camp(s) are required, Enbridge shall provide the Board, for approval, an environmental and socio-economic protection plan for the Camp(s) that includes the following:

a) the location of each Camp and a description of the environmental setting;
b) a suitably-scaled plot plan that includes satellite imagery showing land use in the immediate and surrounding areas;
c) the size of the Camp(s) in hectares;
d) the predicted human occupancy of the Camp(s) including the number of people accommodated at the Camp and the number of Camp staff;
e) the proposed schedule for constructing, operating and dismantling the Camp(s);
f) identification of the environmental and socio-economic effects of construction, operating and dismantling of the Camp(s);
g) a description of all proposed mitigation measures associated with f); and
h) documentation or information describing Enbridge's consultation with the relevant municipalities, regional authorities, all potentially affected stakeholders and Aboriginal groups;
i) a summary of any issues or concerns raised by municipalities, regional authorities, all potentially affected stakeholders and Aboriginal groups; and
j) a description of how the issues and concerns identified in i) are addressed in the environment and socio-economic protection plan for the Camp(s).

9. Construction Emergency Preparedness and Response Planning

Enbridge shall file with the Board, **at least 30 days prior to commencing construction**, the Emergency Response Plan, specific to the Section 58 Facilities, that will be implemented during the construction phase of the Section 58 Facilities. The plan shall include spill contingency measures that Enbridge will employ in response to accidental spills attributable to construction activities, 24-hour medical evacuation, fire response, and security.

10. Aboriginal Consultation Reports

Enbridge shall file with the Board, **at least 30 days prior to commencing construction**, and at the end of every second month thereafter until completing construction, a report summarizing Enbridge's consultations with all potentially affected Aboriginal groups identified. These reports shall include:

a) a summary of the concerns raised by Aboriginal groups;
b) a description of how Enbridge has addressed or will address the concerns raised;
c) a description of any outstanding concerns; and
d) a description of how Enbridge intends to address any outstanding concerns, or an explanation as to why no further steps will be taken.

11. Commitments Tracking Table

Enbridge shall:

a) file with the Board and post on its Project website, **within 90 days from the date of this Order and at least 30 days prior to commencing construction**, a Commitments Tracking Table (CTT) listing all commitments made by Enbridge in its Application or in its related submissions applicable to the Section 58 Facilities, including reference to:
    i. the documentation in which the commitment appears (for example, the Application, responses to information requests, hearing transcripts, permit requirements, condition filings, or other);
    ii. the accountable lead for implementing each commitment; and
    iii. the estimated timelines associated with the fulfillment of each commitment;
b) update the status of the commitments in a) on its Project website and file these updates with the Board on:
    i. a monthly basis until commencing operations; and
    ii. a quarterly basis until the end of the fifth year following the commencement of operations; and
c) maintain at its construction office(s):
    i. the CTT listing all regulatory commitments and their completion status, including those commitments resulting from Enbridge's Application and subsequent filings and conditions from permits, authorizations and approvals;
    ii. copies of any permits, approvals or authorizations issued by federal, provincial or other permitting authorities, which include environmental conditions or site-specific mitigation or monitoring measures; and
    iii. any subsequent variances to permits, approvals or authorizations referred to in c) ii).

12. Programs and Manuals - Safety

Enbridge shall file with the Board, **at least 30 days prior to commencing construction**, Construction Safety Manuals (project-specific Safety Plans) for the Section 58 Facilities.

13. Heritage Resources

Enbridge shall file with the Board, **at least 14 days prior to commencing construction,** confirmation, signed by an officer of the company, that:

a) it has obtained or will obtain all of the required archaeological and heritage resource permits and clearances from Alberta Culture and Tourism; Saskatchewan Parks, Culture and Sport; and Manitoba Culture, Heritage and Tourism;
b) it will meet any conditions and respond to any comments and recommendations contained in the permits and clearances referred to in a); and
c) it has incorporated or will incorporate any additional mitigation measures into its Facilities EPP as a result of any conditions or recommendations contained in the permits or clearances referred to in a).

14. Construction Schedule

Enbridge shall file with the Board, **at least 14 days prior to commencing construction**, a detailed construction schedule(s) identifying major construction activities, and shall notify the Board of any modifications to the schedule(s) as they occur.

15. Field Joining Program

Enbridge shall file with the Board, **at least 14 days prior to commencing joining activity**, the Field Joining Program.

16. Pressure Testing Program

Enbridge shall file with the Board, **at least 14 days prior to commencing pressure testing**, the Pressure Testing Program that demonstrates compliance with applicable codes, standards and regulatory requirements.

17. Welding and Non-Destructive Examination Procedures

Enbridge shall, **during welding activities**, maintain at each construction site:

a) a copy of the applicable welding procedures;
b) a copy of the applicable non-destructive examination (NDE) and testing procedures used on the Section 58 Facilities; and
c) all supporting documentation related to NDE and testing.

Enbridge shall include, in the applicable NDE and testing procedures referred to in b) and c) above, a requirement to delay NDE of final tie-in welds and any repairs to them for 48 hours following completion of welding.

18. Breeding Bird Survey

In the event of clearing, construction or reclamation activities for the Section 58 Facilities within restricted activity periods for non-migratory birds protected under provincial jurisdiction, and for migratory birds, Enbridge shall retain a qualified avian biologist to carry out a survey prior to these activities, in accordance with current Environment and Climate Change Canada guidance, to identify any birds and active nests in areas immediately surrounding the site. Enbridge shall file the results with the Board **every 15 days when surveys are active during the breeding bird restricted activity period**. The results shall include:

a) documentation or information to confirm that the appropriate provincial and federal government authorities were consulted prior to the activity on the proposed methodology for the survey, the mitigation and monitoring to be used, and a description of any outstanding concerns they may have; and
b) if active nests were found:
    i. mitigation that was or will be implemented, including monitoring, which was developed in consultation with Environment and Climate Change

Canada and the appropriate provincial government authorities, to protect any identified migratory and non-migratory birds and their nests; and

ii. mitigation that was or will be implemented, including monitoring, developed in consultation with Environment and Climate Change Canada to protect any birds listed under the *Species at Risk Act*, and their nests.

19. Construction Progress Reports

Enbridge shall file with the Board, **by the 15th day and the end of each month during construction,** construction progress reports. The reports shall include information on the activities carried out during the reporting period; any environmental, socio-economic, safety and security issues and issues of non-compliance; and the measures undertaken for the resolution of each issue and non-compliance.

Post-Construction and Operations

20. Hardisty Terminal Air Emissions Monitoring Plan

Enbridge shall file with the Board for approval, **at least 90 days prior to operation of the storage tanks**, an air emissions monitoring plan for detecting and recording fugitive H_2S and VOC (benzene) emissions at Enbridge's Hardisty Terminal. The plan shall include:

a) Enbridge's methodology for monitoring local emissions during operation of tanks including:
   i. proposed number and location of vapour monitoring and gas detection equipment to be installed where maximum concentrations were predicted by the air quality assessments, including vertical positioning of equipment (that is, ground level or other height);
   ii. rationale for equipment type (that is, passive or continuous) chosen;
   iii. timing of the deployment of the monitors; and
   iv. the frequency of monitoring at each monitoring device (for example, hourly average, 24-hour average, monthly average);

b) Description of how the data collected will be used to evaluate Enbridge's contributions to overall H_2S emissions in the local area, including:
   i. a plan for how the monitoring approach will be used to verify the accuracy of what was predicted in the air quality assessments for the tanks;
   ii. the feedback mechanisms that will allow the monitoring data to be used to inform operating decisions; and
   iii. how Enbridge will share the data and work with the other Operators in the Hardisty Complex;

c) Details of how Enbridge will use the data collected to assist in preventing the exceedance of Alberta Ambient Air Quality Objectives, including:
   i. the criteria or thresholds, that if met, will trigger the implementation by Enbridge of additional strategies, actions or mitigation; and
   ii. a description of the additional strategies, actions or mitigation that will be considered for implementation pursuant to c)i.

21. Operational Consultation Plan for Aboriginal Groups

Enbridge shall file with the Board for approval, and serve a copy on all potentially affected Aboriginal groups, **at least 60 days prior to commencing operations**, a plan for consultation with Aboriginal groups during the operational phase of the Section 58 Facilities. The plan shall include:

a) a summary of how Aboriginal groups were consulted on the development of the plan, including:
   i. a list of the Aboriginal groups consulted;
   ii. a description of the design of and activities undertaken during the consultation;
   iii. a summary of the results of the consultation in terms of input received from Aboriginal groups; and
   iv. a description of how input received from Aboriginal groups has informed the design of the plan;

b) a discussion of how implementation of the plan will be coordinated with regulatory requirements that may involve consultation with Aboriginal groups, such as the communication of information relating to safety, security and protection of the environment pursuant to paragraph 6.5(1)(m) of the *National Energy Board Onshore Pipeline Regulations*;

c) a description of:
   i. the consultation methods and tools to be used to implement the plan;
   ii. how information gathered through the implementation of the plan will be used by Enbridge; and
   iii. how information gathered through the implementation of the plan will be provided to participating Aboriginal groups; and

d) a description of how the plan will be regularly evaluated and adapted as appropriate.

22. Operational Consultation Plan for Landowners

Enbridge shall file with the Board for approval, and provide notice to all landowners and a copy upon request, **at least 60 days prior to commencing operations**, a plan for consultation with landowners during the operational phase of the Section 58 Facilities. The plan shall include:

a) a summary of how landowners were consulted on the development of the plan, including:
   i. a description of the design of and activities undertaken during the consultation;
   ii. a summary of the results of the consultation in terms of input received from landowners; and
   iii. a description of how input received from landowners has informed the design of the plan;

b) a discussion of how implementation of the plan will be coordinated with regulatory requirements that may involve consultation with landowners, such as the communication of information relating to safety, security and protection

of the environment pursuant to paragraph 6.5(1)(m) of the *National Energy Board Onshore Pipeline Regulations*;

c) a description of:
   i. the consultation methods and tools to be used to implement the plan;
   ii. how information gathered through the implementation of the plan will be used by Enbridge; and
   iii. how information gathered through the implementation of the plan will be provided to participating landowners; and
d) a description of how the plan will be regularly evaluated and adapted as appropriate.

23. Operation and Maintenance Manual

Enbridge shall file with the Board, **at least 14 days prior to commencing operations**, its Operation and Maintenance Manual.

24. Condition Compliance by the Accountable Officer

Within 30 days after commencing operations, Enbridge shall file with the Board a written confirmation, by its accountable officer, as defined in the *National Energy Board Onshore Pipeline Regulations*, that the Section 58 Facilities were completed and constructed in compliance with all applicable conditions to this Order. If compliance with any of these conditions cannot be confirmed, the accountable officer shall file with the Board details as to why compliance cannot be confirmed. The filing required by this condition shall include a statement confirming that the signatory to the filing is Enbridge's accountable officer.

25. Landowners Issues Resolution Tracking Table

Enbridge shall file with the Board, within **30 days after commencing operations**, a written confirmation that it created and will maintain records to chronologically track landowner issues resolution related to the Section 58 Facilities. The landowner issues resolution records shall include:

a) the date the issue was raised with Enbridge;
b) how the issue was raised with Enbridge (that is, telephone, mail, email);
c) subsequent dates of all telephone calls, correspondence, site monitoring/inspections, follow-up reports and other documentation related to the issue and issue resolution;
d) updated contact information for all persons involved in the issue resolution;
e) the date the issue was resolved; and
f) if the issue was not resolved, any further actions to be taken or a rationale for not taking further action.

26. Noise Mitigation Reporting

Enbridge shall file with the Board, **within 6 months after commencing operations of the Kerrobert, Glenavon, Glenboro and Gretna pump stations**, the results of the noise monitoring to be conducted at those stations once operational, and notification of whether each station is compliant with Alberta Energy Regulator (AER) Directive 38, as amended or replaced from time to time. For any stations for which the monitoring results indicate non-compliance with Directive 38, Enbridge shall also file with the Board a noise mitigation plan that describes the mitigation measures that will be implemented by Enbridge to bring the station into compliance with Directive 38.

27. Pipeline Geographic Information System (GIS) Data

Enbridge shall file with the Board, **within one year after commencing operations**, GIS data in the form of an Esri® shape file that contains locations and names of pump stations, terminals, custody transfer meters, and block valves (for example, all station bypass valves), as applicable.

The datum must be NAD83 and projection must be geographic (latitudes and longitudes).

28. Air Emissions Monitoring Plan Reporting

Enbridge shall file annual reports with the Board, **on or before 1 March**, outlining the results of air emissions monitoring as part of its Air Emissions Monitoring Plan **(Condition 20)**, and any adaptive management responses implemented by Enbridge in response to those results.

29. Noise Monitoring Reporting

For those pump station(s) reported to the Board as non-compliant with AER Directive 38, as amended or replaced from time to time **(Condition 26)**, Enbridge shall conduct noise monitoring on completion of noise mitigation implementation and file with the Board, **within 15 months of commencing operations of the pump station(s)**, a report that includes:

a) the monitoring results;
b) a description of any mitigation measures that were implemented in addition to those provided in the noise mitigation plan filed with the Board **(Condition 26)**; and
c) confirmation that compliance with AER Directive 38 has been achieved at the station(s) or, where compliance is not reasonably practical due to noise conditions resulting from factors unrelated to the Section 58 Facilities, confirmation that operation of the Section 58 facilities has resulted in a zero net increase in sound levels at that station.

30. Operational Consultation Report

Enbridge shall file with the Board, **five years after commencing operations**, an operational consultation report. The report shall be filed with the Board **on or before 31 December of the reporting year** and shall include:

a) a summary of the outcomes of the operational consultation plans for Aboriginal groups and landowners **(Conditions 21** and **22)**, including activities undertaken and lessons learned;
b) an assessment of the overall effectiveness of the operational consultation plans for Aboriginal groups and landowners; and
c) a summary of any changes or improvements that have been made to the operational consultation plans for Aboriginal groups and landowners.

Appendix V - Decommissioning Order Conditions

In these conditions, the terms and expressions below (in bold) have the following meaning:

Application – Enbridge's application dated 5 November 2014, pursuant to sections 52 and 58 of the *National Energy Board Act* (NEB Act) and section 45.1 of the *National Energy Board Onshore Pipeline Regulations* (OPR).

Decommissioned Period – The period of time from when the Existing Line 3 Pipeline has been decommissioned (that is, the treatments have been applied) until leave to abandon the Existing Line 3 Pipeline is granted by the Board pursuant to paragraph 74(1)(d) of the NEB Act.

Decommissioning Activities – The treatment measures that will be applied to the Existing Line 3 Pipeline by Enbridge to decommission the Existing Line 3 Pipeline, including cleaning of the pipeline, isolation, segmentation, and work at railroad crossings, but not including buoyancy control measures.

Enbridge – Enbridge Pipelines Inc.

Existing Line 3 Pipeline - The portion of the existing Line 3 pipeline, forming part of the Project, for which Enbridge requests an Order pursuant to section 45.1 of the OPR.

for approval - When a condition requires a filing for NEB approval, Enbridge must not commence the indicated activity until the Board issues its written approval of that filing.

including – Use of this term, or any variant of it, is not intended to limit the elements to just those listed. Rather, it implies minimum requirements with the potential for augmentation, as appropriate.

NEB or Board – National Energy Board

Order – Board Order authorizing the decommissioning of the Existing Line 3 Pipeline pursuant to section 45.1 of the OPR.

Project – The Line 3 Replacement Program, and all of its applied-for components.

Section 52 Pipeline and related Facilities – The proposed pipeline and related facilities, forming part of the Project, for which Enbridge requests a Certificate pursuant to section 52 of the NEB Act. Specifically, the Section 52 Pipeline and related Facilities are two new 914 mm (NPS 36) replacement pipeline segments with a total Pipeline length of approximately 1,096 km. The proposed pipeline would transport heavy, medium and light crude oil at a maximum operating pressure (MOP) of 9,930 kPa.

Decommissioning Order Conditions

General

1. Condition Compliance

Enbridge shall comply with all of the conditions contained in this Order, unless the Board otherwise directs.

2. Engineering and Safety

Enbridge shall decommission and maintain the Existing Line 3 Pipeline in accordance with the specifications, standards, commitments made and other information referred to in the Application or in its related submissions.

3. Environmental Protection

Enbridge shall implement or cause to be implemented all of the policies, practices, programs, mitigation measures, recommendations, procedures and its commitments for the protection of the environment included in or referred to in its Application or in its related submissions.

4. Timing of Decommissioning Activities

Enbridge shall complete the Decommissioning Activities **within three years from the date that the Section 52 Pipeline and related Facilities are placed in service**.

5. Order Expiration (Sunset Clause)

Unless the Board otherwise directs prior to [five years from the date of the Order], this Order shall expire on [five years from the date of the Order] unless Decommissioning Activities or buoyancy control measures have commenced by that date.

Prior to and During Decommissioning Activities and Buoyancy Control Measures

6. Buoyancy Control Measures Implementation Plan

Enbridge shall file with the Board for approval, **at least 60 days prior to commencing implementation of buoyancy control measures**, a plan (Plan) that comprehensively describes the buoyancy control measures and the parameters that will be monitored during the Decommissioned Period. The Plan shall include the following:

a) Enbridge's goals and measurable objectives for buoyancy control for the Existing Line 3 Pipeline;
b) any additional information obtained from the results of detailed engineering and research and development programs, and ongoing consultation with stakeholders and Aboriginal groups;

c) a summary of the factors and considerations, both from an engineering and environmental perspective, that were used by Enbridge to determine appropriate buoyancy control measures. This summary shall include the thresholds Enbridge used to decide when the risks to the environment as a result of applying a specific buoyancy control measure outweigh the benefits of implementing the measure, and when a different measure would be chosen;
d) a finalized list of locations where buoyancy control measures will be implemented, including an Enbridge mainline Kilometre Post (MKP) reference. For each location include:
    i. a description of the measure(s) to be applied and the specific risks that are being mitigated by application of the measure(s);
    ii. the construction method(s) to be used to apply each measure; and
    iii. the anticipated construction scheduling and duration for each measure being applied;
e) Enbridge's framework for evaluating the potential effects to the environment of undertaking the buoyancy control measure(s) at each location identified in d), including the decision-making criteria Enbridge used to decide:
    i. in what circumstances advance fieldwork and studies would be conducted; and
    ii. in what circumstances additional mitigation measures would be applied to mitigate any identified potential environmental and socio-economic effects;
f) for each location provided in d):
    i. the results of any advance fieldwork conducted,
    ii. identification of any potential environmental and socio-economic effects that may occur as a result of implementing the buoyancy control measures;
    iii. a description of the measures taken by Enbridge to avoid or reduce potential environmental and socio-economic effects including:
        a. measures taken while choosing treatment sites to avoid potential environmental and socio-economic effects; and
        b. any mitigation measures that will be applied to minimize the potential environmental and socio-economic effects identified;
g) an Environmental Protection Plan (Buoyancy Control Measures EPP), specific to activities required to implement the buoyancy control measures at each of the locations identified in d), and for which the specific mitigation measures to be applied at those locations are identified in f). The EPP shall include all environmental procedures including plans, criteria for implementation of those procedures, mitigation measures and monitoring, including:
    i. soil handling procedures;
    ii. weed and clubroot management procedures;
    iii. water quality and quantity protection measures;
    iv. fish and fish habitat protection measures and riparian habitat management procedures;
    v. erosion control measures;

vi. any survey procedures for species at risk to be undertaken prior to the implementation of the buoyancy control measures;
vii. contingency plans and mitigation should species at risk, rare plants or rare ecological communities be discovered prior to or during the activities;
viii. waste and spill management plans;
ix. a reclamation plan for each land use type affected (for example, native prairie, cultivated land, wetlands, riparian) including a description of the condition to which Enbridge intends to reclaim and maintain the right-of-way once the activities have been completed, and a description of the measurable goals for reclamation; and
x. environmental alignment sheets showing the location of the buoyancy control measures to be implemented [d) above], the environmental and socio-economic setting, and the specific mitigation measures to be applied to minimize effects [f.iii.b) above];

h) a description of how buoyancy issues related to the Existing Line 3 Pipeline will be monitored, as part of Enbridge's operations and maintenance program, during the Decommissioned Period;
i) a description of how input from potentially affected stakeholders and Aboriginal groups has been incorporated into the Plan; and
j) a summary of any outstanding concerns raised by potentially affected stakeholders and Aboriginal groups regarding the Plan, including a description of how these concerns have been or will be addressed by Enbridge or an explanation as to why no further steps will be taken.

7. Outstanding Traditional Land Use Investigations – Buoyancy Control Measures

Enbridge shall file with the Board for approval and serve a copy on all participating Aboriginal groups, **at least 60 days prior to commencing implementation of buoyancy control measures**, a plan to address outstanding Traditional Land Use (TLU) investigations for the implementation of buoyancy control measures. The plan shall include:

a) a summary of the status of TLU investigations undertaken for the implementation of buoyancy control measures, including Aboriginal group-specific TLU studies and any supplementary pre-construction field investigation or reconnaissance activities relevant to potentially affected Aboriginal groups;
b) a summary of the effects of the buoyancy control measures on the current use of lands and resources for traditional purposes identified in the investigations;
c) a summary of the mitigation measures proposed by Enbridge and/or by affected Aboriginal groups to address the effects of the buoyancy control measures identified in the investigations;
d) a description of how Enbridge has incorporated any additional mitigation measures into its Buoyancy Control Measures EPP;
e) a description of any outstanding concerns raised by potentially affected Aboriginal groups regarding potential effects of the decommissioning of the

Existing Line 3 Pipeline on the current use of lands and resources for traditional purposes, including a description of how these concerns have been or will be addressed by Enbridge; and

f) a summary of any outstanding TLU investigations or follow-up activities that will not be completed prior to commencing implementation of buoyancy control measures, including an explanation as to why these will not be completed prior to commencing implementation of buoyancy control measures, and an estimated completion date, if applicable

8. Aboriginal Consultation Reports

Enbridge shall file with the Board, **at least 30 days prior to the earlier of commencing implementation of buoyancy control measures or commencing Decommissioning Activities**, and at the end of every second month thereafter until Decommissioning Activities are completed, a report summarizing Enbridge's consultations with all potentially affected Aboriginal groups identified.

These reports shall include:

a) a summary of the concerns raised by Aboriginal groups;
b) a description of how Enbridge has addressed or will address the concerns raised;
c) a description of any outstanding concerns; and
d) a description of how Enbridge intends to address any outstanding concerns, or an explanation as to why no further steps will be taken.

9. Landowners Issue Resolution Tracking

Enbridge shall file with the Board, **at least 30 days prior to the earlier of commencing implementation of buoyancy control measures or commencing Decommissioning Activities**, a written confirmation that it created and will maintain records to chronologically track landowner issues resolution related to the decommissioning of the Existing Line 3 Pipeline and the implementation of buoyancy control measures. The landowner issues resolution records shall include:

a) the date the issue was raised with Enbridge;
b) how the issue was raised with Enbridge (that is, telephone, mail, email);
c) subsequent dates of all telephone calls, correspondence, site monitoring/inspections, follow-up reports and other documentation related to the issue and issue resolution;
d) updated contact information for all persons involved in the issue resolution;
e) the date the issue was resolved; and
f) if the issue was not resolved, any further actions to be taken or a rationale for not taking further action.

10. Minimally-Invasive Procedure Evaluation Report

Enbridge shall file with the Board, **at least 150 days prior to commencing Decommissioning Activities**, a report outlining the results of the research and development conducted to evaluate a minimally-invasive procedure for segmenting the Existing Line 3 Pipeline. If the procedure is considered viable, the report shall also include:

a) a detailed description of how the procedure would be implemented on the Existing Line 3 Pipeline, including a description of the equipment that would be used during construction;
b) the decision-making framework that Enbridge will use to decide the circumstances under which the procedure will be used versus more conventional excavation techniques, in consideration of the relative potential environmental effects that may arise as a result of using either method;
c) an assessment of the potential environmental and socio-economic effects that may arise as a result of using the procedure;
d) the mitigation measures that would be implemented to protect the environment when using the procedure; and
e) confirmation that, if the procedure will be used during the decommissioning of the Existing Line 3 Pipeline, the information provided in a) to d) will be included in the Final Decommissioning Plan (**Condition 11**), and the locations where it will be applied will be identified in that Plan.

11. Final Decommissioning Plan

Enbridge shall file with the Board for approval, **at least 120 days prior to commencing Decommissioning Activities**, a Final Decommissioning Plan (Plan) that comprehensively describes the Decommissioning Activities and the parameters that will be monitored during the Decommissioned Period. This Plan shall be a comprehensive compilation of all procedures, mitigation measures and commitments, as set out in Enbridge's Application, and as otherwise committed to in its related submissions.

The Plan shall include the following:

a) Enbridge's goals and measurable objectives regarding the Plan;
b) any additional information obtained from the results of detailed engineering, research and development programs, and ongoing consultation with stakeholders and Aboriginal groups;
c) a summary of the factors and considerations, both from an engineering and environmental perspective, that were used by Enbridge to determine the appropriate Decommissioning Activities. This shall include the thresholds Enbridge used to decide when the risks to the environment as a result of applying a specific treatment measure outweigh the benefits of implementing the measure, and when a different treatment measure would be chosen;
d) a finalized list of locations where Decommissioning Activities will be undertaken, including an Enbridge Mainline Kilometre Post (MKP) reference. For each location include:

i. a description of the treatment(s) to be applied and the specific risks that are being mitigated by application of the treatment measure(s);
ii. the construction method(s) to be used to apply each treatment; and
iii. the anticipated construction scheduling and duration for each treatment measure being applied;

e) the water withdrawal and water disposal locations to be used for pipeline cleaning, including:
i. estimated volumes of water to be withdrawn from each source or released at each location after use;
ii. any temporary or permanent access requirements; and
iii. the anticipated timing of water withdrawal and disposal at these locations;

f) Enbridge's framework for evaluating the potential effects to the environment of undertaking the Decommissioning Activities at each location identified in d) and e), including the decision-making criteria Enbridge used to decide:
i. in what circumstances advance fieldwork and studies would be conducted; and
ii. in what circumstances additional mitigation measures would be applied to mitigate any identified potential environmental and socio-economic effects;

g) for each location provided in d) and e):
i. results of any advance fieldwork conducted;
ii. identification of any potential environmental and socio-economic effects that may occur as a result of the Decommissioning Activities;
iii. a description of the measures taken by Enbridge to avoid or reduce potential environmental and socio-economic effects including:
a. measures taken while choosing the treatment, water withdrawal and water release sites to avoid potential environmental and socio-economic effects; and
b. any mitigation measures that will be applied to minimize the potential environmental and socio-economic effects identified;

h) an Environmental Protection Plan (Decommissioning EPP), specific to the Decommissioning Activities at each of the locations identified in d) and e), and for which the specific mitigation measures to be applied at those locations are identified in g). The Decommissioning EPP shall include all environmental procedures including plans, criteria for implementation of those procedures, mitigation measures and monitoring, including:
i. soil handling procedures;
ii. weed and clubroot management procedures;
iii. water quality and quantity protection measures;
iv. fish and fish habitat protection measures and riparian habitat management procedures;
v. erosion control measures;
vi. survey procedures for species at risk to be undertaken prior to Decommissioning Activities;

vii. contingency plans and mitigation should species at risk, rare plants or rare ecological communities be discovered prior to or during Decommissioning Activities;

viii. waste and spill management plans;

ix. a reclamation plan for each land use type affected (for example, native prairie, cultivated land, wetlands, riparian) including a description of the condition to which Enbridge intends to reclaim and maintain the right-of-way once Decommissioning Activities have been completed, and a description of the measurable goals for reclamation; and

x. updated environmental alignment sheets showing the location of the Decommissioning Activities to be undertaken [d) above)], the water withdrawal and water disposal locations during pipeline cleaning [e) above], the environmental and socio-economic setting, and the specific mitigation measures to be applied to minimize those effects [g.iii.b) above];

i) a description of the parameters that will be monitored on the Existing Line 3 Pipeline right-of-way, as part of Enbridge's operations and maintenance program, during the Decommissioned Period;

j) a description of how input from potentially affected stakeholders and Aboriginal groups has been incorporated into the Plan; and

k) a summary of any outstanding concerns raised by potentially affected stakeholders and Aboriginal groups regarding the Plan, including a description of how these concerns have been or will be addressed by Enbridge or an explanation as to why no further steps will be taken.

12. Decommissioning Treatment Monitoring Program

Enbridge shall file with the Board for approval, **at least 120 days prior to commencing Decommissioning Activities**, a Decommissioning Treatment Monitoring Program (Program) for the Existing Line 3 Pipeline in the Decommissioned Period. The objective of the Program shall be for Enbridge to monitor and verify the effectiveness of the treatment measures applied to reduce the environmental and socio-economic risks of decommissioning the Existing Line 3 Pipeline in-place. These risks include pipeline lift and exposure, ground subsidence, erosion, slope instability, soil and water contamination, and the Existing Line 3 Pipeline acting as water conduit.

The Program shall include:

a) the scientific methodology or protocol for monitoring the treatment measures and their effectiveness in preventing the predicted environmental and socio-economic effects of decommissioning the Existing Line 3 Pipeline in-place;

b) the objectives or thresholds to which success of the treatment measures will be evaluated;

c) the methodology for selecting monitoring locations;

d) the frequency, timing and locations of monitoring and the rationale for each;

e) the criteria and thresholds for the circumstances under which modified or additional treatment measures would be applied to the Existing Line 3 Pipeline, or pipe removed, based on the monitoring results; and

f) a schedule for filing reports with the Board of the monitoring results and any adaptive management responses, including pipe removal, implemented in response to those results.

13. Outstanding Traditional Land Use Investigations – Decommissioning Activities

Enbridge shall file with the Board for approval and serve a copy on all participating Aboriginal groups, **at least 60 days prior to commencing Decommissioning Activities**, a plan to address outstanding Traditional Land Use (TLU) investigations for the Decommissioning Activities. The plan shall include:

a) a summary of the status of TLU investigations undertaken for the Decommissioning Activities, including Aboriginal group-specific TLU studies and any supplementary pre-construction field investigation or reconnaissance activities relevant to potentially affected Aboriginal groups;
b) a summary of the effects of the Decommissioning Activities on the current use of lands and resources for traditional purposes identified in the investigations;
c) a summary of the mitigation measures proposed by Enbridge and/or by affected Aboriginal groups to address the effects of the Decommissioning Activities identified in the investigations;
d) a description of how Enbridge has incorporated any additional mitigation measures into its Decommissioning EPP;
e) a description of any outstanding concerns raised by potentially affected Aboriginal groups regarding potential effects of the Decommissioning Activities on the current use of lands and resources for traditional purposes, including a description of how these concerns have been or will be addressed by Enbridge; and
f) a summary of any outstanding TLU investigations or follow-up activities that will not be completed prior to commencing Decommissioning Activities, including an explanation as to why these will not be completed prior to commencing Decommissioning Activities, and an estimated completion date, if applicable.

14. Decommissioning Consultation Plan for Aboriginal Groups

Enbridge shall file with the Board for approval, and serve a copy on all potentially affected Aboriginal groups, **at least 60 days prior to commencing Decommissioning Activities**, a plan for consultation with Aboriginal groups during the Decommissioned Period. The plan shall include:

a) a summary of how Aboriginal groups were consulted on the development of the plan, including:
    i. a list of the Aboriginal groups consulted;
    ii. a description of the design of and activities undertaken during the consultation;
    iii. a summary of the results of the consultation in terms of input received from Aboriginal groups; and
    iv. a description of how input received from Aboriginal groups has informed the design of the plan;

b) a discussion of how implementation of the plan will be coordinated with regulatory requirements that may involve consultation with Aboriginal groups, such as the communication of information relating to safety, security and protection of the environment pursuant to paragraph 6.5(1)(m) of the *National Energy Board Onshore Pipeline Regulations*;
c) a description of:
    i. the consultation methods and tools to be used to implement the plan;
    ii. how information gathered through the implementation of the plan will be used by Enbridge; and
    iii. how information gathered through the implementation of the plan will be provided to participating Aboriginal groups; and
d) a description of how the plan will be regularly evaluated and adapted as appropriate.

15. Decommissioning Consultation Plan for Landowners

Enbridge shall file with the Board for approval, and provide notice to all landowners and a copy upon request, **at least 60 days prior to commencing Decommissioning Activities**, a plan for consultation with landowners during the Decommissioned Period. The plan shall include:

a) a summary of how landowners were consulted on the development of the plan, including:
    i. a description of the design of and activities undertaken during the consultation;
    ii. a summary of the results of the consultation in terms of input received from landowners; and
    iii. a description of how input received from landowners has informed the design of the plan;
b) a discussion of how implementation of the plan will be coordinated with regulatory requirements that may involve consultation with landowners, such as the communication of information relating to safety, security and protection of the environment pursuant to paragraph 6.5(1)(m) of the *National Energy Board Onshore Pipeline Regulations*;
c) a description of:
    i. the consultation methods and tools to be used to implement the plan;
    ii. how information gathered through the implementation of the plan will be used by Enbridge; and
    iii. how information gathered through the implementation of the plan will be provided to participating landowners; and
d) a description of how the plan will be regularly evaluated and adapted as appropriate.

16. Decommissioning – Railroad Crossings

Enbridge shall cut, fill with an engineered fill material that will provide structural integrity and address the risk of subsidence, and plate all railroad crossings. Enbridge shall file with the Board, **at least 15 days prior to commencing Decommissioning Activities**:

a) its plan to cut, fill with an engineered fill material that will provide structural integrity and address the risk of subsidence, and plate all active railroad crossings; and
b) its plan for monitoring the integrity of filled railroad crossings during the Decommissioned Period.

<u>During Decommissioned Period</u>

17. Condition Compliance by the Accountable Officer

Within 30 days after completion of Decommissioning Activities, Enbridge shall file with the Board a written confirmation, by its accountable officer, as defined in the *National Energy Board Onshore Pipeline Regulations*, that the Decommissioning Activities and buoyancy control measures were completed in compliance with all applicable conditions to this Order. If compliance with any of these conditions cannot be confirmed, the accountable officer shall file with the Board details as to why compliance cannot be confirmed. The filing required by this condition shall include a statement confirming that the signatory to the filing is Enbridge's accountable officer.

18. Decommissioned Period Action Plans and Notification

In the event that Enbridge intends to take any action (for example, remedial actions, adaptive management measures) in respect of the Decommissioned Line 3 Pipeline during the Decommissioned Period, it shall file with the Board:

a) Written notification of the action, **at least 21 days prior to commencing the action**, if one or more of the following circumstances apply:
    i. greater than 100 m of ground disturbance in respect of the Existing Line 3 Pipeline will be required;
    ii. there are unresolved concerns from potentially affected stakeholders and Aboriginal groups and these concerns relate specifically to the action to be undertaken;
    iii. ground disturbance using power-operated equipment will occur within 30 m of a wetland, a waterbody, or their substrates; or
    iv. there will be activity potentially interfering with watercourse navigation;

    Written notification shall include:
    i. description of the action to be undertaken and rationale for why it is required;
    ii. location of the action to be undertaken (for example, legal land description, kilometer post);
    iii. reference to applicable section(s) of the Decommissioning EPP and relevant company manuals, as applicable;

iv. timing and duration of the action to be undertaken; and
v. regarding consultation:
    a. where there are no unresolved concerns from potentially affected stakeholders and Aboriginal groups related specifically to the action to be undertaken, a summary or overview of consultation that has been undertaken with those stakeholders and Aboriginal groups or justification as to why consultation was not carried out; and
    b. where there are remaining unresolved concerns from potentially affected stakeholders and Aboriginal groups related specifically to the action to be undertaken, a summary of the unresolved concerns of those stakeholders and Aboriginal groups and a complete record or table of consultation that has been undertaken with those parties or justification as to why consultation was not carried out.

b) A site-specific Action Plan, for approval, **at least 60 days prior to commencing the action**, if greater than 100 m of the Existing Line 3 Pipeline will be removed. The Plan shall include:
    i. description of the action to be undertaken and rationale for why it is required;
    ii. discussion of any alternative measures considered;
    iii. an explanation as to whether an application for leave to abandon the affected section of pipeline will be filed with the Board and, if not, a justification as to why not;
    iv. location of the action to be undertaken (for example, legal land description, kilometer post);
    v. description of the environmental and socio-economic setting;
    vi. construction methods to be used;
    vii. timing and duration of the action to be undertaken;
    viii. regarding consultation:
        a. where there are no unresolved concerns from potentially affected stakeholders and Aboriginal groups related specifically to the action to be undertaken, a summary or overview of consultation that has been undertaken with those stakeholders and Aboriginal groups or justification as to why consultation was not carried out; and
        b. where there are remaining unresolved concerns from potentially affected stakeholders and Aboriginal groups related specifically to the action to be undertaken, a summary of the unresolved concerns of those stakeholders and Aboriginal groups and a complete record or table of consultation that has been undertaken with those parties or justification as to why consultation was not carried out;
    ix. results of any environmental field surveys conducted;
    x. the potential environmental and socio-economic effects that may occur as a result of the action to be undertaken; and

xi. an Environmental Protection Plan (EPP), specific to the action to be undertaken, that outlines the mitigation measures that will be implemented to minimize environmental effects. The EPP shall include the following (as relevant):

a. soil handling procedures;
b. weed and club root management procedures;
c. wetland, watercourse and waterbody protection measures;
d. erosion control measures;
e. pre- construction survey procedures for species at risk;
f. contingency plans and mitigation should species at risk be found;
g. waste and spill management plans; and
h. a reclamation plan for each land use type affected (for example, native prairie, cultivated land, wetlands, riparian), including a description of the condition to which Enbridge intends to reclaim and maintain the area disturbed once the action has been completed, and a description of the measurable goals for reclamation.

In the event that urgent action is necessary to address a risk to either safety or the environment, and the circumstances described in a) or b) above apply, Enbridge shall notify the Board in writing of the action as soon as reasonably practicable. If the urgent action includes removal of greater than 100 m of the Existing Line 3 Pipeline, Enbridge shall also file an Action Plan containing the information required in b) as soon as is reasonably practicable in the circumstances.

19. Decommissioning Consultation Report

Enbridge shall file with the Board, **five years after completing Decommissioning Activities**, a decommissioning consultation report. The report shall be filed with the Board on or before 31 December of the reporting year and shall include:

a) a summary of the outcomes of the decommissioning consultation plans for Aboriginal groups and landowners (**Conditions 14** and **15**), including activities undertaken and lessons learned;
b) an assessment of the overall effectiveness of the decommissioning consultation plans for Aboriginal groups and landowners; and
c) a summary of any changes or improvements that have been made to the decommissioning consultation plans for Aboriginal groups and landowners.

20. Status Reporting

Enbridge shall file a status report with the Board **every five years during the Decommissioned Period**. Reporting shall commence five years after the completion of Decommissioning Activities, and reports shall be filed with the Board on or before 31 December of the reporting year. The status report shall include:

a) a description of the operating status of the other pipelines in the same corridor as the Existing Line 3 Pipeline (for example, operating, deactivated, decommissioned, abandoned);
b) maps or schematic drawings of a suitable scale, including kilometre post markings as appropriate, showing the relative placement of the Existing Line 3 Pipeline in relation to the other pipelines in the same corridor;
c) a description of the circumstances, if any, that are limiting Enbridge's ability to complete the remaining steps in the lifecycle of the Existing Line 3 Pipeline, including removal of above-ground facilities and final land reclamation and remediation, but excluding ongoing monitoring;
d) an outlook as to how the operating status of the other pipelines in the same corridor as the Existing Line 3 Pipeline, and the circumstances described in c), are expected to change over the subsequent five years;
e) a list of any adaptive management measures, including remedial actions, undertaken in respect of the Existing Line 3 Pipeline during the previous five year period, including any actions that required notification to, or approval by, the Board **(Condition 18)**;
f) a summary of any outstanding concerns raised by potentially affected stakeholders and Aboriginal groups regarding the Existing Line 3 Pipeline, including a description of how these concerns have been or will be addressed by Enbridge or an explanation as to why no further steps will be taken; and
g) Enbridge's expected timeline for submitting an abandonment application to the Board for the Existing Line 3 Pipeline or any part of it, as applicable, pursuant to **Condition 22** or otherwise.

21. Decommissioning Treatment Monitoring Program Reporting

Enbridge shall file reports with the Board and serve notice of the filings on potentially affected stakeholders and Aboriginal groups, based on the schedule referred to in part f) of the Decommissioning Treatment Monitoring Program **(Condition 12)**, outlining the monitoring results and any adaptive management responses, implemented by Enbridge in response to those results. Enbridge shall provide a copy of the reports to potentially affected stakeholders and Aboriginal groups upon request.

22. Requirement to File an Abandonment Application

No later than one year after either:

a) Enbridge reports to the Board, pursuant to **Condition 20(c)** that there are no circumstances limiting Enbridge's ability to complete the remaining steps in the lifecycle of the Existing Line 3 Pipeline; or
b) the Board notifies Enbridge that it must apply for leave to abandon the Existing Line 3 Pipeline, or any part of it;

Enbridge shall file with the Board an application for leave to abandon the Existing Line 3 Pipeline or such part of it, as applicable.

Appendix VI – Conditions Diagrams

Section 52 Certificate Conditions*

*Note: Not all Section 52 Certificate conditions are reflected on this diagram

NEB Regulatory Oversight

The NEB monitors condition compliance, including compliance with the NEB Act, the OPR and any other relevant regulations, by conducting inspections, audits and other activities throughout the lifecycle of the Project.

90 days prior to construction
Pipeline EPP
(Condition 6)
Strain Based Design
(Condition 7)

90 days prior to construction of any watercourse crossings
Finalized Watercourse Crossings Inventory and Designs
(Condition 8)

30 days prior to commencing watercourse trenchless crossings
Watercourse Trenchless Crossings
(Condition 15)

15 days prior to commencing crossing work
Depth of Cover at Water Crossings
(Condition 16)

15 days prior to commencing contingency crossing
Contingency Watercourse Crossing Method
(Condition 17)

14 days prior to commencing relevant activity
Slope and Bank Failures
(Condition 20)
Field Joining Program
(Condition 21)
Pressure Testing Program
(Condition 22)

60 days prior to commencing pressure testing
Protection of the Environment Pressure Testing
(Condition 26)

90 days after construction
Geotechnical Report on Slope Stability
(Condition 28)

Within 18 months after commencing operations
Emergency Response Exercise
(Condition 35)

Prior to and During Construction

Post-Construction and Operations

60 days prior to construction
Outstanding Traditional Land Use Investigations
(Condition 10)

30 days prior to construction
Aboriginal Consultation Reports and Aboriginal Monitoring Plan
(Conditions 11 and 12)

14 days prior to construction
Heritage Resources
(Condition 18)

10 days prior to commencing construction of watercourse crossing
Authorization under *Fisheries Act*
(Condition 23)

Every 15 days during the Restricted Activity Period as applicable
Breeding Bird Survey
(Condition 25)

60 days prior to commencing operations
Operational Consultation Plans for Aboriginal Groups and Landowners
(Conditions 29 and 30)

Within 30 days after commencing operations
Landowners Issues Resolution Tracking
(Condition 33)

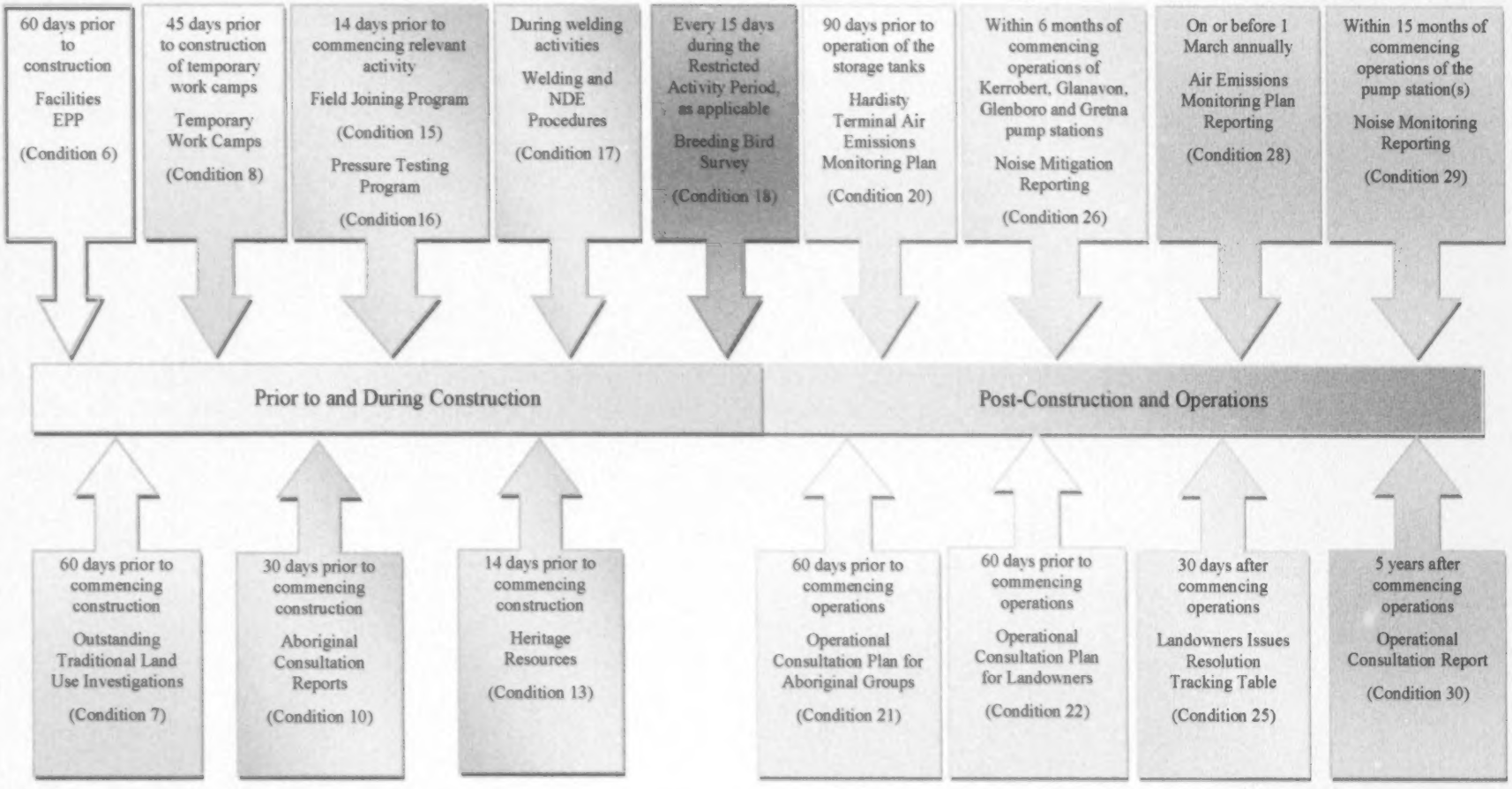
5 years after commencing operations
Operational Consultation Report
(Condition 37)

Section 58 Order Conditions*

*Note: Not all Section 58 Order conditions are reflected on this diagram

NEB Regulatory Oversight

The NEB monitors condition compliance, including compliance with the NEB Act, the OPR and any other relevant regulations, by conducting inspections, audits and other activities throughout the lifecycle of the Project.


60 days prior to construction
Facilities EPP
(Condition 6)
45 days prior to construction of temporary work camps
Temporary Work Camps
(Condition 8)
14 days prior to commencing relevant activity
Field Joining Program
(Condition 15)
Pressure Testing Program
(Condition16)
During welding activities
Welding and NDE Procedures
(Condition 17)
Every 15 days during the Restricted Activity Period, as applicable
Breeding Bird Survey
(Condition 18)
90 days prior to operation of the storage tanks
Hardisty Terminal Air Emissions Monitoring Plan
(Condition 20)
Within 6 months of commencing operations of Kerrobert, Glanavon, Glenboro and Gretna pump stations
Noise Mitigation Reporting
(Condition 26)
On or before 1 March annually
Air Emissions Monitoring Plan Reporting
(Condition 28)
Within 15 months of commencing operations of the pump station(s)
Noise Monitoring Reporting
(Condition 29)
Prior to and During Construction
Post-Construction and Operations
60 days prior to commencing construction
Outstanding Traditional Land Use Investigations
(Condition 7)
30 days prior to commencing construction
Aboriginal Consultation Reports
(Condition 10)
14 days prior to commencing construction
Heritage Resources
(Condition 13)
60 days prior to commencing operations
Operational Consultation Plan for Aboriginal Groups
(Condition 21)
60 days prior to commencing operations
Operational Consultation Plan for Landowners
(Condition 22)
30 days after commencing operations
Landowners Issues Resolution Tracking Table
(Condition 25)
5 years after commencing operations
Operational Consultation Report
(Condition 30)

Decommissioning Order Conditions*

*Note: not all Decommissioning Order conditions are reflected in this diagram

NEB Regulatory Oversight

The NEB monitors condition compliance, including compliance with the NEB Act, the OPR and any other relevant regulations, by conducting inspections, audits and other activities throughout the lifecycle of the Project.

60 days prior to BC

Buoyancy Control Measures Implementation Plan

(Condition 6)

150 days prior to DA

Minimally-Invasive Procedure Evaluation Report

(Condition 10)

120 days prior to DA

Final Decommissioning Plan

(Condition 11)

120 days prior to DA

Decommissioning Treatment Monitoring Program

(Condition 12)

15 days prior to DA

Decommissioning - Railroad Crossings

(Condition 16)

21 days (written notification) or 60 days (Action Plan) prior to commencing relevant action

Decommissioned Period Action Plans and Notification

(Condition 18)

Every 5 years during Decommissioned Period

Status Reporting

(Condition 20)

Requirement to File an Abandonment Application

(Condition 22)

Prior to and During Decommissioning Activities (DA) and Buoyancy Control Measures (BC)

During Decommissioned Period

60 days prior to BC

Outstanding Traditional Land Use Investigations - BC

(Condition 7)

30 days prior to earlier of BC or DA

Aboriginal Consultation Reports

(Condition 8)

30 days prior to the earlier of BC or DA

Landowners Issue Resolution Tracking

(Condition 9)

60 days prior to DA

Outstanding Traditional Land Use Investigations - DA

(Condition 13)

60 days prior to DA

Decommissioning Consultation Plan for Aboriginal Groups

(Condition 14)

60 days prior to DA

Decommissioning Consultation Plan for Landowners

(Condition 15)

5 years after completing DA

Decommissioning Consultation Report

(Condition 19)

Schedule determined in Decommissioning Treatment Monitoring Program

Decommissioning Treatment Monitoring Program Reporting

(Condition 21)